Dividend payout and working capital: evidence from the London Stock Exchange

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Abstract

Dividend payout and working capital: evidence from the London Stock Exchange

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Dividend policy is a fundamental component of finance. It has profound significance for stakeholders, including shareholders, investors, managers, bankers, lenders, and scholars. Theoretical and empirical studies have examined dividend payout extensively. However, the results are far from conclusive and dividend payout is still one of the most controversial issues in corporate finance. Black (1976) calls this the "dividend puzzle."

The current study re-examines the relationship between dividend payout and earnings (via a new measurement) on the London Stock Exchange. More importantly, this study explores the relationship between dividend payout and working capital. To provide more robust results, we adopt the (two-step) System Generalised Method of Moments (S-GMM) estimator and investigate the dividend payouts of 1,575 firms listed on the London Stock Exchange, for the period of 1991 to 2015. The findings reveal that a change in working capital has a significant nonlinear (concave) impact on dividend payouts. In other words, a relatively low change in working capital has a positive effect on dividend payouts, while a relatively high change in working capital is negatively correlated with dividend payouts.

We split the overall sample into a positive group and a positive and negative group according to the calculated turning point of change in working capital (5.326). We discovered that this concave relationship is a mixture of positive linear correlation (in the positive group) and a concave correlation (in the positive and negative group). We also observed that the (dividend-adjusted) earnings variable is not significant, which suggests that dividend payout is not a function of the current earnings. We discovered a similar result in our subsamples: the coefficients of (dividend-adjusted) earnings are not significant in any subsample. We also observed that young firms, firms listed on the AIM, firms with sufficient working capital, and firms with high volatility in sales tend to adjust their dividend payouts via working capital. The empirical evidence shows that our results are consistent and robust. Therefore, we argue that working capital is a significant determinant of dividend payout and it can be used as a source of dividend payout. Overall, the results provide new insights into the value of working capital and suggest dividend payout and working capital are important for understanding corporate payout policy.

Keywords: dividend payouts, working capital, earnings, nonlinear relationship, London Stock Exchange, generalised method of moments.

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List of Acronyms

ΔWC: Change in Working Capital
ΔTP: Change in Trade Payables
ΔTR: Change in Trade Receivables
2SLS: 2 Stage Least Squares
AIM: Alternative Investment Market
CCC: Cash Conversion Cycle
CD: Cash Dividend
Div-adj Earnings: Dividend-adjusted Earnings
Dum (fs): Dummy Variable of Financial Shocks
EPS: Earnings Per Share
FE: Fixed-Effects
FSA: Financial Services Authority
FRS: Financial Reporting Standard
GBP: Great Britain Pound
GDPg: Gross Domestic Product Growth Rate
Gearing: Gearing (Leverage) Ratio
GICS: Global Industry Classification Standard
GLS: Generalised Least Squares
GMM: Generalised Method of Moments
Inf: Inflation Rate
Inv: Investment
IPOs: Initial Public Offers
LSE: London Stock Exchange
MM: Main Market
MSE: Mean Sum of Squares
MtB: Market to Book Ratio
OLS: Ordinary Least Squares
QML: Quasi-Maximum Likelihood
RE: Random-Effects
Rep: Stock Repurchase
ROE: Return on Equity
SD: Stock Dividend
SMEs: Small and Medium Enterprises
TA: Total Asset
Tax: Taxation
UKLA: United Kingdom Listing Authority
VAR: Vector Auto Regression
VECM: Vector Error Correction Model

Chapter 1 Introduction

1.1 Background

It is a widely held view that maximising shareholders' wealth is the most important goal of a business entity. As a return on shareholders' investment, dividend payout is an appropriate financial indicator to measure shareholders' wealth. Issuing dividends is favourable for several reasons: first, dividends can attract investors who desire a stable cash flow but do not want to incur transaction costs; second, dividends can reduce cash availability to minimise agency costs; third, managers may increase dividends to signal optimism concerning future cash flows (Ross et al., 2008).

However, this does not mean that increasing dividend payouts lead to greater profits for shareholders. Dividend policy builds on financial theories, such as asset pricing, capital structure and capital budgeting (Barker, 1999; Allen and Michaely, 2003). Increasing dividend payouts (either the cash dividend or the stock dividend) arbitrarily would have a negative impact on a firm's financial situation (on their levels of available cash, capital structure, and taxation rates). On the one hand, greater cash dividend payouts mean more tax charges for shareholders. If the tax rate is high, firms are more likely to favour capital gains on investments rather than dividends (Peterson et al., 1985). On the other hand, increasing the stock dividend payout would lead to a decrease in the firm's share price, which might send a bad signal to individual investors. Additionally, increasing stock dividends would dilute some shareholders' control, which might change a firm's management structure (Khan and Jain, 2017). As a result, increasing the dividend payout might not necessarily enhance the total value of shareholders' wealth. Once dividend policy is established, it is difficult to reduce dividends without adversely affecting the firm's share price (Black, 1976).

Prior literature has offered various rationales for the dividend puzzle (Black, 1976). Several dividend theories have evolved over the past few decades. While Lintner (1956) advocated the practice of dividend smoothing.[1] Miller and Modigliani (1961) have proposed the dividend irrelevance theory. Due to the inconclusive results of these dividend theories, both researchers and managers have struggled to find an optimum dividend payout policy.

As argued, a change to dividends are often associated with other financial behaviours; it is hard

[1] Lintner (1956) proposed the dividend smoothing theory via earnings. It means that dividend decisions are based on past and current earnings, so that observed dividend payout exhibits a significant degree of smoothing.

to adjust the dividend to the desired level without considering other financial policies. Moreover, financial constraints might also have an adverse effect on dividend payouts. Therefore, individual firms must have a good understanding of the dividend payout in order to achieve the optimum dividend policy, balancing different financial decisions and enhancing the firm's overall value.

1.2 Payout Policy

A payout is the undistributed amount of earnings from a firm to its shareholders (Allen and Michaely, 2003). It can be either a dividend payout or a stock repurchase. Most firms pay dividends on a regular basis (quarterly or semi-annually). Occasionally, firms announce a one-time special dividend (an extra cash dividend). Alternatively, firms can choose to repurchase stock using an open market repurchase, a tender offer, or a targeted repurchase. For example, in 2004 Microsoft had 60 billion USDs of undistributed cash. Under high pressure from its shareholders, Microsoft announced an increase in annual dividend to 0.32 USD per share; share repurchases of approximately 30 million USDs within the next four years; and a special dividend of 3 USDs per share to its shareholders. Microsoft had more than 10 billion outstanding shares, and the special dividend announced in 2004 was a remarkable amount (32.6 million USDs).

A policy can be described as a consistent system of principles to enable smooth decision-making processes and to achieve targeted goals. A payout policy, especially a dividend payout, does not mean that the decisions made are arbitrarily or randomly (Allen and Michaely, 2003). A good payout policy not only involves solving the payout puzzle, but also the trade-offs (understanding all of the related advantages and disadvantages).

1.3 Method of Payment

The purpose of dividends is to return wealth to the shareholders. There are two types of dividends: cash dividends and stock dividends (Wei and Xiao, 2009). A cash dividend is a payment taken from a firm's earnings and given to shareholders. This is either in the form of cash or a bank transfer. In contrast, a stock dividend, increases the total number of shares outstanding, thereby decreasing each share's value.

1.4 Cash Dividend Versus Stock Dividend

When issuing a cash dividend or stock dividend, a firm always starts with its retained earnings. The only difference is the way it flows out of the firm's retained earnings. Issuing cash dividends means retained earnings decrease from the firm's equity account, while cash decreases from the asset account at the same level on a firm's balance sheet. Economic value is transferred from the firm to the shareholders, instead of the firm retaining the funds (for example, using them to invest). In short, the money is no longer in the system. Issuing stock dividends refers to the process of shifting retained earnings into the firm's share capital account, which means that the shareholders' equity account remains unchanged on a firm's balance sheet. Shareholders who received cash dividends must pay tax on the value of the distribution, which lowers the final returns. However, when firms issue stock dividends there is no need to consider the tax effect (Ross et al., 2008). The most prominent benefit of issuing a stock dividend is that shareholders do not have to pay taxes on them.

One disadvantage of issuing stock is that it results in decreasing share prices. If a firm issues a 5% stock dividend, it will increase the number of shares by 5%. A shareholder who has 100 shares will get five more shares in lieu of a cash payout. If the firm's share price is $10 per share (with 1 million outstanding shares), the share price will change from $10 to $9.524 ($\frac{10 \text{ x } 1\text{million}}{1\text{million x } 1.05}$) after the stock dividend is issued. This is because issuing a stock dividend does not alter the total value of a firm's equity. The total value will be $10 million, but the number of shares has increased. Therefore, the share price will be diluted as a result of issuing stock dividends (Ehrhardt and Brigham, 2009). Another concern is that a stock dividend will change the number of shares that different shareholders own. This may affect some shareholder's voting rights, and in turn, may affect the management structure (Yermack, 2010).

It appears that a stock dividend is superior to a cash dividend for the firm since it is not accompanied by a cash option. However, this does not mean that a cash dividend is not favourable, given the disadvantages of issuing a stock dividend. In fact, issuing cash or stock dividends is a matter of choice for a firm's policymakers.

1.5 Dividend Payout Policy

Dividend policy is a set of standards that firms use to decide how much of their earnings they should pay out to shareholders as a reward. A firm can issue large dividends (for example, Microsoft in 2004), or it can issue small dividends (like new emerging firms), or none at all (such as Google in 2013) and invest more into its business. Dividend policy indicates whether a firm should pay out a significant amount at the present moment or invest more in the firm. Timing is a key consideration in decisions involving dividends (Brooks, 2016). While there are several different approaches to dividend policy, there are three primary methods of paying dividends: a stable dividend approach, a residual dividend approach and a hybrid dividend approach.

1.5.1 Stable Dividend Approach

The stable dividend policy (either a constant growth dividend or a fixed dividend), highlights the distribution of net profits before considering the firm's internal needs. This means that shareholders receive their dividends first and the remainder is allocated for the firm's needs.

Dividend payouts are typically regarded as a positive sign and often lead to further investment, particularly in the long-term. Miller and Rock (1985) note that dividend signalling equilibrium exists under information asymmetry. Likewise, Baker and Phillips (1993) report that stock dividends signal favourable information about the firm's future. Allen et al. (2000) show that paying shareholders dividends can attract more institutional investors. Eun and Huang (2007) suggest that dividend payouts signal management's willingness to pay cash to shareholders. Anderson et al. (2011) also reveal that dividend payouts send a positive signal to the stock market.

Investors favour the constant growth dividend approach than fixed dividend policies. The constant growth approach allows investors to observe the increase in their return gradually. Overall, this policy reduces uncertainty for individual investors and offers investors a more stable income.

1.5.2 Residual Dividend Approach

The residual dividend approach emphasises satisfying a firm's internal needs prior to issuing shareholder dividends. Using this approach, fewer dividends or zero dividends are issued in order to make up any shortages of funds (for internal needs) or other investments. This may send a negative signal to individual investors and shareholders. Lakonishok and Lev (1987) argue that issuing stock dividends can be a costly signal. Below and Johnson (1996) note that market conditions are significant for both dividend increases and dividend decreases. Bernhardt et al. (2005) conclude that a firm may increase its dividend payouts if there is either an increase in cash at hand (a good signal) or a decrease in investment (a bad signal).

1.5.3 Hybrid Dividend Approach

The third policy, the hybrid dividend approach, combines aspects of the residual and stable dividend policies. In other words, firms may adopt either a residual or a stable dividend policy and then change to a stable/residual dividend policy. In the financial markets, the hybrid dividend approach is typically used by firms that issue dividends. This is because a low dividend payout developed by a firm in its early years could be easily retained in the following periods. Based on this low dividend payout, the firm would issue another dividend only if they have surplus earnings. DeAngelo and DeAngelo (2006) have observed that in their early years, firms tend to increase equity and issue small dividends only when investment opportunities are higher than the internal capital; later on, firms will issue more dividends in order to minimise agency problems when internal funds are higher than investment opportunities.

1.5.4 Summary

There is nothing intrinsically good or bad about these three dividend policies. However, each approach has a different impact on both shareholders' wealth and a firm's value. A key advantage of the residual dividend policy is that firms can use surplus money to develop capital budget projects (Baker, 2009). The residual dividend policy is useful for establishing a long-term dividend policy.

Table 1.1 Sixteen Largest Companies in the S&P 500 that Paid No Dividends in 2013

Company	Market Value (in billion USDs)	Company	Market Value (in billion USDs)
Google (GOOG)	291.9	Cegene (CELG)	50.1
Berkshire Hathaway (BRK-B)	187.3	Princeline.com (PCLN)	40.9
Amazon.com (AMZN)	126.1	DirectTV (DTV)	35.0
Gilead Sciences (GILD)	80.7	Yahoo (YAHOO)	29.3
eBay (EBAY)	66.8	Salesforce.com (CRM)	23.4
American International (AIG)	66.9	Adobe (ADBE)	22.1
Biogen Idec (BIIB)	53.4	Crown Castle (CCI)	20.6
Express Scripts (ESRX)	50.2	Cognizant Technology (CTSH)	20.1

Source: Sterman (2013)

Table 1.1 illustrates the top 16 firms on the S&P 500 that paid no dividends. These firms have a high market value, and most of them operate highly-profitable and fruitful businesses. However, they issued no dividends. This was not because they had insufficient funds (most of these firms have substantial cash reserves – in 2013 Google had nearly 19 billion USDs cash and cash equivalents on its balance sheet), but because they can use the cash in more beneficial ways. For example, multinational firms like Google, Adobe, and eBay, pay no dividends. Instead, they invest aggressively in future potential growth projects such as high-tech products and online apps/programmes because their market strategy is more e-commerce/software orientated. However, a significant disadvantage of the residual dividend policy is that dividends may be unstable over different periods of time. In other words, earnings vary depending on market demands.

No single dividend policy is favourable to all firms. Policymakers can only learn the advantages and disadvantages of dividend policies and make decisions based on multiple trade-offs.

1.6 Problem Statement

1.6.1 Earnings

Linter (1956), who conducted one of the earliest studies, concluded that net earnings (or profit after tax) are a predominant variable, which leads to dividend payout changes. Wedig (1994) suggests that dividend payouts are driven by risk aversion and sustainable earnings. Kasanen et al. (1996) also find a positive relationship between reported earnings and dividend payout. Similarly, Amidu and Abor (2006) conclude a positive relationship between dividend payout ratio and firm profitability. Truong and Heaney (2007) demonstrate that firms are more likely to pay dividends when profit is high, and debt is low. Pettit (1976) uncovered a negative relationship between earnings and dividends. Further, Manuel et al. (1993) have reported that dividend announcements that closely precede current cash flow signals lead to more negative valuation effects. Further, Ferris et al. (2006) reveal that only 22% of UK firms with negative earnings pay dividends, compared to 73% of Japanese firms with negative earnings who paid dividends in 2001. Furthermore, Mehta et al. (2014) argue that income is negatively related to dividend payout.

While the relationship between earnings and dividend payout has been extensively researched, the results are far from conclusive. One limitation of the previous literature is that the earnings variable may affect the dividend payout. Dividend announcements are made after the earnings have been reported. This means that regardless of the earnings measurements used in the previous studies, the earnings variable contains (or at least contains part of) the declared dividends. Thus, it is likely to result in a less accurate (estimated) coefficient of earnings,[2] which decreases the efficiency of the research model.

[2] For more details see Section 2.3, Chapter 2.

1.6.2 Working Capital

Working capital refers to a firm's current financial status. It includes capital used for its day-to-day business transactions and is calculated as the current assets minus the current liabilities. Working capital includes cash, short-term investments (marketable securities), inventories, trade receivables, accruals, trade payables, short-term loans and debts. Working capital management deals with the current accounts and maintains an equilibrium between profits and risks. Literature has shown that the proper management of working capital enhances firm performance (Deloof, 2003; Padachi, 2006). Due to the nature of working capital, scholars and managers often limit its significance to its short-term financial aspects. However, we propose that working capital may also affect firms' long-term goals (such as their dividend policies).

A firm must have sufficient funds in order to issue a cash dividend. Therefore the obvious starting point of any dividend payout decision begins with cash (at the bank) on the balance sheet. When the cash amount is not enough to cover the declared cash dividend, other current assets (such as trade receivables) and current liabilities (such as trade payables), become equally important in the decision-making process. Owing to its high liquidity, we assume that working capital can be used as a source for the dividend payout. To illustrate these arguments, we begin with the following illustration:

For example: On 14^{th} of November, Year 1, firm ABC made a sale of £100,000 on credit to its customers (we assume a tax rate of 16%). The double-entry for the transaction should be recorded as follows:

	Debit	Credit
Trade Receivables	£116,000	
Tax Payables (GST)		£16,000
Sales/Service Revenue		£100,000

Most of the transactions among business entities are not cash deals, but credit deals (for example, 90 days credit).When a customer pays cash to ABC on the 14^{th} of February of the following year, the double-entry for ABC is recorded as:

	Debit	Credit
Cash (at Bank)	£116,000	
Trade Receivables		£116,000

According to Accrual Basis Accounting, a firm should record any revenues or expenses on the date of the transaction, rather than when the cash is received or paid (Cash Basis Accounting). This creates a time difference, between recognising revenue and receiving cash. If firm ABC needs to decide on a dividend at the end of year 1, the earnings will include the £100,000 of sales.

However, the cash balance will be £100,000 short because the money is still "on the way". Firm ABC will not receive the money until the following year and yet still has to make a dividend decision in year 1. Therefore, trade receivables place some constraints on the dividend payout. If the sales figure in the above transaction is not £100,000 but £100 billion or £100 trillion, then the impact of trade receivables on the dividend payout can be crucial. A firm might also hold some short-term loans. For example, if firm ABC borrows £100,000 from the bank on the 14th of November in year 1, then the double-entry is:

	Debit	Credit
Cash (at Bank)	£100,000	
Payables		£100,000

Assuming this short-term borrowing is for 3 months, and the interest rate is 6%, then on the 14th of February year 2, the ABC double entry includes:

	Debit	Credit
Payables	£100,000	
Interest Expenses	£6,000	
Cash		£106,000

If ABC needs a dividend payout plan, then the short-term loan from the bank can be used for paying dividends in subsequent years. However, this may affect the firm's performance in year 2 since ABC has to pay back its debt within a certain time period. Similarly, one can also infer that payables may have an effect on the dividend payout.

1.6.3 Stock Dividend

The stock dividend is not as popular as the cash dividends within firms. There are limited studies that document firms' stock dividend payouts. Most of the studies (Fama and French, 2001; Farsio et al., 2004; von Eije and Megginson, 2008; Javakhadze et al., 2014) only focus on the cash dividend payout and ignore the stock dividend payout. A stock dividend, as another form of dividend payout, is equally as important as a cash dividend. Thus stock dividend determinants should not be omitted when examining dividend payouts.

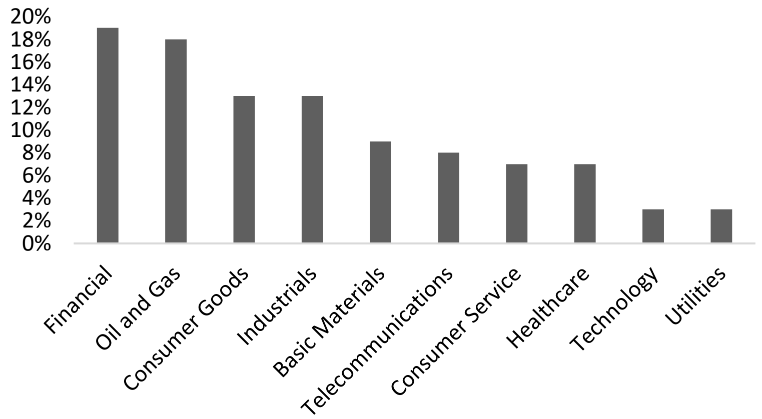
Wei and Xiao’s study (2009) investigates the stock dividend in China’s stock market. However, Wei and Xiao’s (2009) stock dividend model does not take stock repurchase into consideration. The reasons are: first, there was no financial law in China on stock repurchase before 2005 Second, firms only began to repurchase their own stock after 2008. Compared to the UK equity market, stock repurchase has become much more popular among firms over the past two decades. As another payout method, stock repurchase, has attracted a similar amount of attention as dividends over the years. We believe that it is necessary to test the impact of stock repurchase on dividend payouts, to improve the adequacy of the stock dividend determinant model.

1.6.4 The UK Perspective

1.6.4.1 The London Stock Exchange

As one of the world’s oldest financial markets, the London Stock Exchange (LSE) provides an international exchange platform, designed for both British and international firms. Its main objective is to provide firms, and other issuers, who need to raise capital with investors. Over the last decades, the LSE has developed into one of the most diversified and actively traded stock markets in the world. In 2012, there were more than 2,400 firms listed on the LSE, from a variety of sectors (see Table 1.2). Financial, Oil and Gas, Consumer Goods and Industrials are the top four sectors with the highest market capitalisations. In 2015, the total market capitalisation reached over £3,900 billion with £3,876.2 billion from the Main Market (MM) and £73,076.6 million from the Alternative Investment Market (AIM).[3]

Table 1.2 Market Capitalisation of Firms Listed on the LSE by Industry



Source: London Stock Exchange Data as at June 2012

[3] Source: www.londonstockexchange.com/statistics/markets/markets.htm

The capital market consists of several sub-sections: Primary Market, Secondary Market, Equities, Fixed Income, and Derivatives.[4] The majority of trading takes place in the Equities section which consists of the MM and the AIM.[5] The MM is the top market of LSE, and it is designed for larger and multinational firms. The AIM market is for smaller, emerging firms. This market has lower disclosure requirements which are designed specifically for high-growth firms that seek to raise capital.

Firms listed on the LSE are regulated by the UK Listing Authority (UKLA), and the Financial Services Authority (FSA). Listing categories are designed to distinguish between the listing standards that apply to the MM or the AIM. To list on the MM, firms are required to satisfy the UK's listing rules (they may also include FSA declarations and diligence reports) or meet the EU (European Union) minimum requirements. Firms applying for the AIM are required to appoint a nominated adviser who must be registered with the LSE. Firms also need to comply with the Prospectus Rules under the FSA, with certain exclusions. These exclusions require further confirmation from the FSA. If a firm does not continually meet the listing standards (either in the MM or the AIM), then it is removed (delisted). Moreover, all firms listed on the LSE must comply with the UK Corporate Governance Code or the corporate governance code in their domestic countries.

Due to the relatively high listing standards, the LSE offers reliable information on a firm's perspectives to all users. Moreover, an individual firm's real-time data, which updates at a high frequency, is also available under the LSE. This data is valuable and is normally consumed and/or referenced by market users, agencies and databases (such as *DataStream* and *Bloomberg*).

1.6.4.2 UK Recessions

In 2008, the UK entered into a recession. Table 1.3 shows that it was the deepest recession (regarding lost output) in the UK since 1955 (Allen, 2010). In 2009, actual growth saw the sharpest decline (-5.0%) in GDP. The slowdown affected all sectors of the economy, as well as the UK equity market.

The downturn in economic activity was global, with many countries, including all G7 member countries, falling into recession during 2008. The UK was in recession longer than the other G7 economies and was the last to exit. However, Japan (8.7%), Italy (6.9%) and Germany (6.8%) suffered greater total contractions in GDP than the UK's 6.4%. Both Japan and Italy have since suffered a further quarter of negative growth. Following two successive quarters of economic growth in 2009 and 2010,

[4] Source: www.lseg.com/about-london-stock-exchange-group.
[5] Source: www.londonstockexchange.com/traders-and-brokers/private-investors/private-investors/stock-markets/main-market-and-aim/main-market-and-aim.htm

the UK economy finally appeared to be on the rise. Despite some downward shocks, the FTSE 100 has risen sharply after 2009, and the housing market has shown increasing strength. The UK has recovered reasonably well and today, is the fastest growing economy among the G7 members.[6]

Table 1.3 UK and Other G7 Countries Recessions

	2007 Q2	2007 Q3	2007 Q4	2008 Q1	2008 Q2	2008 Q3	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4
UK	0.6%	0.5%	0.5%	0.7%	-0.1%	-0.9%	-1.8%	-2.6%	-0.7%	-0.3%	0.4%
Canada	1.0%	0.5%	0.3%	-0.2%	0.1%	0.1%	-1.0%	-1.8%	-0.9%	0.2%	1.2%
France	0.4%	0.7%	0.3%	0.5%	-0.4%	-0.2%	-1.5%	-1.8%	0.3%	0.2%	0.6%
Germany	0.3%	0.8%	0.1%	1.6%	-0.6%	-0.3%	-2.4%	-3.5%	0.4%	0.7%	0.0%
Italy	0.2%	0.1%	-0.5%	0.4%	-0.6%	-0.9%	-2.2%	-2.7%	-0.5%	0.5%	-0.3%
Japan	0.2%	-0.1%	0.4%	0.7%	-1.1%	-1.3%	-2.7%	-3.6%	1.5%	-0.1%	0.9%
US	0.8%	0.9%	0.5%	-0.2%	0.4%	-0.7%	-1.4%	-1.7%	-0.2%	0.6%	1.4%

Note: All countries' GDPs are measured quarterly
Source: Allen (2010)

However, after its recovery, the UK economy returned to recession at the beginning of 2012 (GDP reduced by 0.2%), leading the UK to its first double-dip recession since 1970. Compared to 2011, the service sector increased only by 0.1%, the manufacturing sector declined by 0.4%, and the construction sector decreased severely by 3% in the first quarter of 2012.

Table 1.4 Summary of the Forecast – UK Economy [7]

Year	Real Gross National Income (a)	Real GDP (a)	Unemploy-ment (b)	CPI (c)	RPIX (d)	External Current Balance (e)	PSNB (f)
2012	0.1	0.2	7.8	2.6	3.0	-59.2	113.3
2013	1.2	1.2	8.0	2.5	3.0	-42.5	112.4
2014	1.9	1.8	7.8	2.2	2.8	-36.9	93.5

Note: (a) Percentage change, year-on-year. (b) ILO definition, fourth quarter, rate. (c) Consumer prices index, percentage change, fourth quarter on fourth quarter. (d) Retail price index, excluding mortgages, percentage change, and fourth quarter on fourth quarter. (e) Year, £ billion. (f) Public sector net borrowing, fiscal year, £ billion. Excludes the impact of the transfer of the Royal Mail pension scheme in April 2012. Includes flows from the Bank of England's Asset Purchase Facility.
Source: National Institute of Economic and Social Research

According to the National Institute of Economic and Social Research's 2013 economic forecast report (see Table 1.4), the country's GDP was expected to grow by 1.2% and 1.8% in 2014 and the year following, respectively. The unemployment rate was expected to remain at around 8% in 2014. The

[6] Source: www.worldbank.org.
[7] The National Institute of Economic and Social Research on "Prospects for the UK Economy" is available at: www.niesr.ac.uk/sites/default/files/NIESR%20UK%20economy%20forecast%20-%20press%20release_1.pdf.

report stated that the consumer price index would decrease gradually to 2.2% in 2014. Moreover, the net national saving only counted as 0.5% of GDP in 2012 and was expected to recover to around 2.5% of GDP in 2017. Due to the UK double-dip recession in 2012, analysts estimated that business investment volumes would remain below 2007 levels and would not recover until after 2017. The external financial shocks put more pressure on the UK government and critically affected firm performance.

1.6.4.3 UK's Tax Regime

Under the UK tax system, when a shareholder receives a dividend, a basic rate of income tax (different tax rates are applied via different tax bands) is to be paid, based on the dividend issued. This ensures that the income tax will not be taxed twice. However, this practice causes problems for some non-tax paying firms, such as special charities, trusts and pension funds which are not allowed to reclaim their taxes and thus are in effect taxed on their income (Chaturvedi, 2009). There are many firms with different businesses listed on the LSE, including taxpaying and non-tax paying firms. In the US, the corporate tax rate is only 15% when firm profits are lower than $50,000. However, it can be as high as 35% if the profits exceed $18,333,333.[8] In 2015, the UK corporate tax rate was a fixed rate at 20%, however, this was reduced to 19% after the 1st of April 2017. Personal income tax rates in the UK vary from 20% to a maximum of 45%.[9] In the US, the personal income tax rate is lower and ranges from 10% up to 39.6%. However, if dividends are qualified (also known as a qualified dividend), some tax expenses can be avoided. In short, while the US dividend income tax may be significantly lower than in the UK, on average, UK corporate tax is lower than that of the US.

1.6.5 Summary

This section summarises the problem statement. Section 1.6.1 demonstrates the limitations of previous earnings measurements. Next, working capital (trade receivables and trade payables) is illustrated with examples which show how it may affect dividend payouts. Section 1.6.3 highlights the importance of stock dividends, which are often omitted or occasionally observed in the literature. The last section provides the rationale for selecting the UK stock market.

Most dividend studies focus on the US stock market. Scholars have paid far less attention to the

[8] Source: www.usa.gov/taxes.
[9] Source: www.gov.uk/browse/tax.

UK stock market. Additionally, studies on dividend payouts under conditions of economic adversity have only examined the impact of the 2008 global financial crisis (see for example, Bozos et al., 2011; Basse et al., 2014). We believe that it is necessary to address all of these unsolved issues in the literature and shed new light on dividend payouts.

1.7 Research Objectives

The current study investigates the dividend payouts of firms listed on the LSE from 1991 to 2015. The study's specific objectives are:

1. To re-investigate the relationship between current earnings and cash dividend payouts in the UK stock market.
2. To examine the correlation between working capital and firms' cash dividend payouts, in the context of the UK stock market.
3. To test the significance of trade receivables and trade payables, in relation to firms' cash dividend payouts in the UK stock market.
4. To explore the impact of working capital on stock dividend and stock dividend determinants (including the stock repurchase) in the UK stock market.
5. To study how external financial shocks (the 2008 global financial crisis and the 2012 double-dip economic recession) affect dividend payouts in the UK stock market.

1.8 Structure of the Thesis

The remainder of the thesis is organised as follows. Chapter 2 reviews relevant literature, including dividend-related theories, earnings and dividends, working capital (including trade payables and receivables) and dividends, stock dividends and dividend payouts under external financial shocks. Chapter 3 provides an overview of the study's data collection processes and research methodology. The descriptive and empirical results are discussed in Chapter 4. Chapter 5 concludes the study, outlines the limitations and provides recommendations for future research.

Chapter 2 Review of Related Literature

2.1 Introduction

This chapter reviews relevant literature on firm dividend payouts in the context of both international and UK stock markets. Section 2.2 reviews common dividend theories. Section 2.3 summarises the literature on earnings and dividend payout and highlights the limitations of previous earnings measurements. Section 2.4 addresses the importance of working capital management and its linkage that dividend policy. Section 2.5 explains trade receivables and payables under working capital management and their possible impact on dividend payouts. Section 2.6 summaries the reasons why working capital affects dividend payouts. Section 2.7 discusses previous studies on stock dividend payouts. The impact of external shock on firm dividend payouts is presented in the last section.

2.2 Review of Dividend Theories

2.2.1 The Dividend Irrelevance Theory

Modigliani and Miller (1961) pioneered the dividend irrelevance policy, which explains that neither a firm's share price, nor the cost of capital, is affected by dividend policy. Sophisticated investors can earn returns via smart buying and selling of stocks, rather than waiting for dividends. In other words, these individual investors will not be interested in the firm's dividend policy. This theory states that regardless of what dividend policy a firm applies, it will not attract any investors. The dividend irrelevance theory (Modigliani and Miller, 1961) is based on several assumptions:

1. **Capital Market:** it assumes that the capital market is perfect. Investors are rational and have access to all available information on the stock market. There are no flotation costs, no transaction costs, and the market price of the share is not affected by large investors.
2. **Taxation:** no tax, or dividends and capital gains are taxed at the same rate.
3. **Investment Policy:** fixed investment policy, meaning that firms never change their investment policies. In other words, new investments are financed through retained earnings, which do not alter, regardless of the risks and the firm's rate of required return.
4. **Risk:** no risks. Investors are confident about the future market prices and the dividends since all information is provided. The discount rate is the same for all types of shares.

Clearly, these assumptions do not hold in any real stock market. In fact, the capital market is either incomplete or imperfect (Fairchild et al., 2014). Tax charges are compulsory in most of the financial markets. Transaction cost, such as floating cost exists, and differences between internal and external finance can be very significant.

2.2.3 Free Cash Flow Theory

Free cash flow theory provides an alternative to dividend irrelevance theory. Jensen (1986) argues that managers have a propensity to increase dividend payouts or repurchase stock if they have a substantial free cash flow. However, Jensen also argues that the creation of debt, which attaches to managers' promises to pay out future cash flows, is a substitution for dividends. Similarly, Giriati's study (2015) on the Indonesian Stock Exchange suggests that firms' free cash flow does not significantly affect the dividend payout. This is because the firm's funds available can come from both internal and external sources. Therefore, dividend payouts are not the only option; stock repurchase and debt creation are also valid alternatives.

2.2.4 Life-Cycle Theory

Mueller's life cycle theory (1972) demonstrates that a young/growing firm tends to pay low/no dividends because cash flows may be low compared to capital expenditure. When the firm matures and has higher and more stable cash flows, then it is more likely to pay dividends. The relationship between the life cycle and dividend is thus mediated by cash flows (Jensen, 1986) and the firm's investment. Flavin and O'Connor (2017) have expanded life-cycle theory with the notion of reputation building. They note that firms in low-disclosure regimes, engage in reputation building behaviour, not only in the early stages of their life-cycle but also as they mature.

2.2.5 Bird-in-the-Hand Theory

Lintner (1962) and Gordon (1963) argue that dividends increase as the cost of equity decreases. The "bird-in-the-hand" theory argues that investors are unsure about capital gains, which arise from retained earnings rather than dividend payouts. In fact, investors pay more attention to dividend payouts prior to expecting capital gains because the dividend is less risky than the expected capital gain (Bhatacharya, 1979; Brigham and Ehrhardt, 2008; Karpavičius and Yu, 2018).

2.2.6 Agency Theory

Jensen's (1986) concept of agency theory illustrates the relationship between the principal (the managers) and agents (the employees) in a firm. This theory focuses on potential problems that may exist in this relationship because of a conflict of interests between the two parties. According to agency theory, firms issue dividends in order to reduce agency costs, thus aligning managers' interests with shareholders' interests (Chang et al., 2016).

2.2.7 Catering Theory

Baker and Wurgler's catering theory (2004) argues that dividend decisions can be explained as managers rationally cater for the stock market's demand. In short, managers issue dividends to cater for investors' demands/expectations (Baker and Wurgler, 2004). Li and Lie (2006) expanded catering theory by analysing changes in dividend payouts and found that managers consider investors' demands when making dividend decisions. They also reported that when managers ignored requests for dividends share prices tended to decline. Ferris et al. (2008, 2009) provide a more robust investigation, on a global basis and argue that firms in common law nations (rather than those in civil law nations) offer more dividend payouts as a way of meeting investors' demands. Similarly, Lee (2010) found that managers of Australian firms cater to retail investors' preference for dividends, when making dividend-related decisions. Recently, Kuo et al. (2013) also revealed that catering incentive has a significantly positive impact on changes in dividend payers of firms in common law countries. However, this result is insignificant for firms in the US and civil law countries. However, von Eije and Megginson (2008) report that the catering effect is not a significant factor in determining the dividend policy of firms in Europe. Jun et al. (2017) have argued that dividend catering is caused mostly by individual investors' dividend chasing. This often leads to potential agency issues.

2.3 Earnings

Given that dividend policy is primarily concerned with how much is paid to shareholders, it is not surprising that earnings have been extensively tested in dividend-related studies. Theories regarding earnings and dividends are mainly based on dividend signalling (Darling, 1957; Chapman, 2018) and dividend smoothing (Lintner, 1956; Syed et al., 2018).

The theory of dividend signalling proposes that a firm's announcement of a dividend payout by a firm gives a strong signal on its future earnings. Some studies claim that the relationship between the current dividend payout and future earnings is positive (see for example, Abeyratna et al., 1996; Dhanani, 2005; Howatt et al., 2009). However, Pettit (1976) argues that the dividend signalling theory is inefficient and that the correlation between earnings and dividend payout is negative. Sant and Cowan (1994) provide an alternative explanation, stating that the dividend does not affect future earnings. DeAngelo et al. (1996) show that changes in dividends do not signal earnings. This is due to managers' behavioural bias. Similarly, Farsio et al. (2004) argue that there is no significant relationship between dividend policy and long-term earnings. They believe that high earnings lead to high dividends based on short-term analyses only. Tse (2005) argues that not every payout pattern is consistent with the dividend signalling hypothesis. Likewise, Bernhardt et al. (2005) note that the signalling concern does not explain why firms pay dividends. In his study on firms listed on the Indian stock market, Ghosh (2008) revealed that dividend payout could not significantly influence the probability of the future prospects of the listed firms. Denis and Osobov (2008) discovered that firms which pay dividends with greater earnings do not need dividends to signal their future earnings. More recently, Fairchild et al. (2014) concluded that there is no empirical evidence which proves that dividend signalling holds.

Lintner (1956) argues that the dividend payout is a function of past and current earnings, and that dividends exhibit a smoothing phenomenon over the years. Other studies note that keeping a stable dividend stream is a crucial goal for managers (Jeong, 2013; Al-Malkawi et al., 2014; Javakhadze et al., 2014). Brav et al. (2005) report that 93.8% of managers are reluctant to reduce dividend and nearly 90% seek to maintain a stable dividend payout. However, Basse et al. (2014) did not find any empirical evidence to support dividend signalling or dividend smoothing in their study of European bank dividends.

A key limitation in the previous literature on dividends and current earnings, is that the current earnings variable incorporates information about the dividend payout variable. A firm's dividend payout policy is usually announced after releasing the earnings report. Therefore, the variable representing current earnings in the previous studies partially incorporates dividend payouts. This issue is indicated as follows:

Assuming a firm's dividend payout (D_{it}) is regressed as a function of earnings (P_{it}, profits after tax) and other determinants ($\sum X_{it}$) such as firm size and leverage:

$$D_{it} = a + bP_{it} + c\sum X_{it} + e_{it} \qquad (2.1)$$

In previous studies (for example, Lintner, 1956; Fama and French, 2001; Denis and Osobov, 2008; Skinner, 2008), the coefficient representing b is used to capture the direct effect of current earnings on dividend payouts. However, the P_{it} variable used in those studies incorporate dividend payouts. Failing to subtract redundant information in the current earnings variable tends to produce biased estimates with respect to the impact of current earnings on dividend payouts. For this reason, we employ Div-adj Earnings, which is measured as profits after tax, minus any declared dividends and other adjustments, to provide a more robust estimate.

For analytical purposes, we further assume that the firm's dividend payout ratio is r at t period. By substituting D_{it} with rP_{it} into equation (2.1), we obtain:

$$D_{it} = a + b[D_{it} + (1-r)P_{it}] + c\sum X_{it} + e_{it} \quad (2.2)$$

By rearranging equation (2.2), we can subsequently obtain equations (2.3) and (2.4), respectively:

$$D_{it} = \frac{\mathrm{a}}{1-\mathrm{b}} + \frac{(1-\mathrm{r})\mathrm{b}}{1-\mathrm{b}}P_{it} + \frac{\mathrm{c}}{1-\mathrm{b}}\sum X_{it} + \frac{e_{it}}{1-\mathrm{b}} \quad (2.3)$$

$$D_{it} = \hat{a} + \hat{b}P_{it} + \hat{c}\sum X_{it} + \hat{e}_{it} \quad (2.4)$$

where $\hat{\boldsymbol{a}} = \frac{\boldsymbol{a}}{\boldsymbol{1-b}}$, $\hat{\boldsymbol{b}} = \frac{(\boldsymbol{1-r})\boldsymbol{b}}{\boldsymbol{1-b}}$, $\hat{\mathbf{c}} = \frac{\mathbf{c}}{\mathbf{1-b}}$ and $\hat{\boldsymbol{e}} = \frac{\boldsymbol{e_{it}}}{\boldsymbol{1-b}}$. In particular, $\hat{\boldsymbol{b}}$ in equation (2.4) represents the modified Div-adj Earnings variable in our study.

2.4 Working Capital

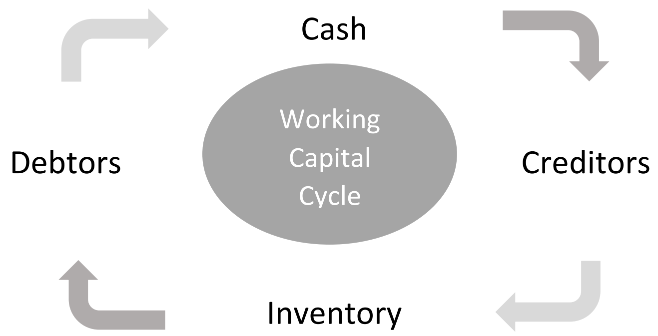
Short-term, or current assets and liabilities, are collectively known as working capital (Brealey et al., 2014). Gross working capital commonly refers to the total current assets. Net working capital is calculated as the total current assets minus total current liabilities. The major accounting items of current assets are cash (at the bank), inventory and trade receivables. Trade payables, accruals and bank overdraft are essential parts of current liabilities (McLaney and Atrill, 2016).

2.4.1 Working Capital Management

Working capital management is the management of current assets and liabilities to ensure that a firm has sufficient cash to pay its short-term obligations. This demonstrates the benefits of liquidity, solvency, efficiency, profitability, and maximising shareholders' wealth (Gitman et al., 2015).

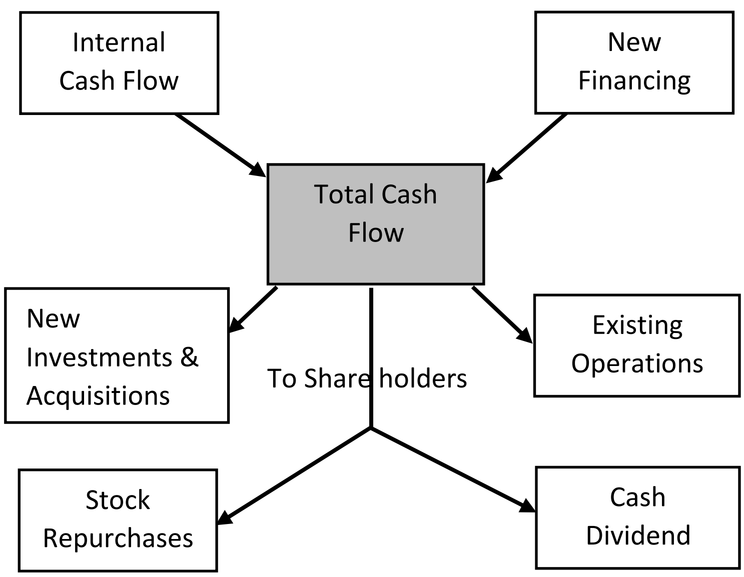
The working capital cycle (see Figure 2.1 (a)) measures the time between making payments to suppliers and collecting cash from credit sale transactions. In other words, it indicates the time that a firm converts current assets and liabilities into cash. The shorter the working capital cycle, the greater the effectiveness of working capital management. The longer the working capital cycle is, the longer a firm's working capital is tied up without earning returns. It is considered desirable to keep the working capital cycle as short as possible (Padachi, 2006). A border view of the cash cycle is presented in Figure 2.1 (b). The figure shows different channels of cash distribution within a firm. Cash can be generated either internally, through working capital (as previously discussed), or externally, through new financing (debt finance or equity finance). The outflow of cash can be used for operating purposes (for example, for research and development costs) or investment purposes (for example, for merger and acquisitions). Alternatively, cash can be used for dividend payouts or stock repurchases. As a necessary component, understanding changes in cash flow can provide critical information on corporate liquidity management (Bates et al., 2018).

Figure 2.1 (a) Working Capital Cycle



Source: www.smallbusiness.wa.gov.au/business-topics/money-tax-and-legal/money-matters/understand-your-accounts/understanding-balance-sheets/components-of-a-balance-sheet/working-capital/

Figure 2.1 (b) Distribution of Corporate Cash Flow



Source: Ross et al. (2016)

Liquidity is a prerequisite to guarantee that firms can meet their short-term obligations and be assured of a profitable operation on an on-going basis (Padachi, 2006). It is affected primarily by cash, trade receivables, inventory, and trade payables that contribute a significant part of the overall cash flow of businesses (Maness, 1994). Changes in firm liquidity levels, either increases or decreases, can be problematic. If the working capital are too high, surplus funds are within the firm but are not making any profit. In which case, the firm can use these funds to gain some returns rather than leave them unused. If the working capital are too low, this may lead to insolvency and illiquidity. This will send a negative signal to the market (Richa, 2014). Therefore, to ensure liquidity and the efficiency of working capital management, it is advisable that investment in working capital components is neither too low nor too high (Mathur, 2007).

2.4.2 Importance of Working Capital Management

Working capital, as a short-term financial indicator, plays a major role in different aspects of the firms. Proper management of working capital is linked to greater firm performance. Mervill and Tavis (1973) show that understanding working capital management can help firms to achieve optimal credit, inventory, and short-term borrowing policies. Sustaining working capital, apart from daily operational uses, is of vital importance for growing firms (Bierman et al., 1975). Scott (1978) provides an estimation method that can improve the accuracy of project evaluation, which is sensitive to working capital errors. Sokoloff (1984) notes that working capital has a dominant effect on investments and is positively associated with firm size. Fazzari and Petersen (1993) contend that under financial constraints, working capital can smooth fixed investments relative to cash flow fluctuations. This is due to working capital's high liquidity.

Most firms have invested a significant amount of cash in working capital, as well as large amounts of trade payables as a source of financing (Deloof, 2003). Working capital management aims to cope with the firms' current accounts and maintain an equilibrium between profits and risks (Ricci and Vito, 2000). Effective management of working capital has a significant effect on firm performance. Deloof (2003) examines the relationship between working capital management and profitability based on 2,000 Belgian firms. The findings show a significant negative correlation between operating income and the number of days for trade receivables, inventory and trade payables. Deloof argues that decreasing the number of days for trade receivables, and inventory can increase shareholders' wealth.

Following Deloof (2003), an increasing number of studies have documented the correlation between working capital and firm performance. Lazaridis and Tryfonidis (2006) report statistical significance between profitability and the cash conversion cycle (CCC) on the Athens Stock Exchange. Ganesan (2007) observes that decreasing the days in working capital can improve firms' profit margins in the US telecommunications sector. Further, Nazir and Afza (2009) demonstrate that more aggressive working capital policies can result in lower profits for non-financial firms on the Karachi Stock Exchange. In his examination of non-financial firms on the US stock exchange, Nobanee (2009) found that decreasing the cash conversion cycle does not increase firm profitability. However, it has been argued that one unit of cash invested in net operating working capital is worth less than one unit of cash for the average firm (see Autukaite and Molay, 2011; Kieschnick et al., 2013). Other findings indicate that there is a negative relationship between gross operating profits and average days in trade receivables; while there is a positive relationship between the cash conversion cycle and profitability (Gill et al., 2010).

Similarly to Deloof (2003) and Lazaridis & Tryfonidis (2006), Karaduman et al. (2010) argue that firms should pay attention to working capital management to enhance firm profitability. In their examination of the Brazilian Stock Exchange, De Almeida and Eid (2014) discovered that greater investment in working capital will reduce firms' value. Working capital not only affects profitability for large firms but also plays a significant role in Small and Medium Enterprises' (SMEs) performance. Padachi (2006) contends that greater investment in inventory and receivables will lead to lower profits. Similarly, Juan García-Teruel and Martinez-Solano, (2007) also detect a negative relationship between the numbers of days in trade receivables and inventory. Further, Banos-Caballero et al. (2010) report that mature firms with more cash flows tend to maintain a longer cash conversion cycle.

Several empirical studies have confirmed a relatively new (non-linear) relationship between working capital and profitability. Banos-Caballero et al. (2012, 2014) have found a concave relationship between working capital and profitability. Similarly, Afrifa (2016) observes a strong concave relation between net working capital and firm performance. However, it converts to a convex relationship when the cash flow variable is taken into consideration. Further, Aktas et al. (2015) reveal that firms pursue optimal working capital by changing levels of working capital, which, in turn, improve share performance. Table 2.1 provides a summary of the studies on working capital.

Table 2.1 Summary of Studies on Working Capital

Year	Author/s (Last name)	Data Sample	Period Analysed	Key Findings	Working Capital Measurement
1973	Mervill and Tavis	n.a.	n.a.	The optimal policy is affected by credit terms, inventory and short-term borrowing, through the associated cash flow.	n.a.
1975	Bierman, Chopra and Thomas	n.a.	n.a.	It is very important for firms with growth opportunities to maintain working capital at a certain level because firms may lose these opportunities unless they have guarded themselves.	n.a.
1984	Sokoloff	US manufacturing firms	1983	The working capital share of investment has a positive relationship with firm size.	trade receivables, inventory
1993	Fazzari and Petersen	15 large manufacturing firms in the US	1970-1984	Under a firm's financial constraints, working capital, as a source of liquidity, can smooth the fixed investment to cash flow ratio.	change in working capital
1995	Lamberson	50 small firms	1980-1991	Working capital is relatively stable. Contrary to Gup (1983) who states that the level of investment in working capital account would likely increase in economic expansion.	current ratio, quick ratio
1998	Shin and Soenen	US 58,985 firms	1975-1994	Days in net trade cycle have a significant and negative impact on firms' profitability.	net trade cycle
2003	Deloof	2,000 most important Belgian firms	1991-1996	Gross operating income is negatively correlated with the number of days of trade receivables, inventories and trade payables.	no. of days trade receivables, inventory, and trade payables
2006	Lazaridis and Tryfonidis	131 firms on Athens Stock Exchange	2001-2004	Cash conversion cycle is significantly correlated with gross operating profit (profitability).	cash conversion cycle
2006	Padachi	58 Mauritian SMEs	1998-2003	An increase in inventory or receivables decreases profitability.	cash conversion cycle

Year	Author/s (Last name)	Data Sample	Period Analysed	Key Findings	Working Capital Measurement
2007	Juan García-Teruel & Martinez-Solano	Spanish SMEs	1996-2002	The number of days of trade receivables and days of inventory are negatively correlated with Spanish SMEs' profitability.	no. of days trade receivables, inventory, and trade payables
2009	Nazir and Afza	204 Pakistani firms	1998-2005	More aggressive working capital and finance policies result in a negative impact on firm profitability.	investment in current assets versus fixed assets
2009	Nobanee	5,802 companies, US	1990-2004	Decreasing the cash conversion cycle may have a negative effect on firm profitability.	cash conversion cycle
2010	Baños-Caballero al.	non-financial Spanish SMEs	2001-2005	A more aggressive working capital policy is likely to be adopted by firms with high leverage ratios, growth opportunities, investments and return on assets. Firms with more cash flow tend to have a longer cash conversion cycle.	cash conversion cycle
2010	Gill, Bigger and Mathur	88 firms listed on the New York Stock Exchange	2005-2007	Average days in trade receivables have a negative impact on gross operating profit (profitability), while the cash conversion cycle is positively correlated with profitability.	cash conversion cycle
2010	Hill, Kelly and Highfield	3,343 US companies	1991-2006	Aggressive working capital policies can increase sales growth but also increase sales volatility	The sum of trade receivables and inventories net of trade payables.
2011	Autukaite and Molay	267 companies, Paris Stock Exchange	2003-2009	One euro invested in cash or in net operating working capital leads to returns less than one euro.	trade receivables plus inventory minus trade payables
2012	Baños-Caballero al.	1,008 Spanish SMEs	2002-2007	Working capital reports a concave relationship to profitability. In other words, an optimal working capital level exits when profitability is maximum.	cash conversion cycle

Year	Author/s (Lastname)	Data Sample	Period Analysed	Key Findings	Working Capital Measurements
2012	Karadagli	169 Turkish listed SMEs	2002-2010	For SMEs, both the cash conversion cycle and net trade cycle have a positive impact on firm performance (operating income and stock returns). For bigger firms, the cash conversion cycle and net trade cycle are negatively correlated with firm profitability.	cash conversion cycle, net trade cycle
2012	Vahid et al.	firms Listed in Tehran Stock Exchange (TSE)	2006-2009	An increase in the collection period, payment period and the net trading cycle will result in decreasing firm profitability.	average collection period, inventory turnover in days, average payment period, cash conversion cycle, and net trading cycle
2013	Ding, Guariglia and Knight	116,000 Chinese industrial firms	2000-2007	Working capital can be used to smooth the cash flow shocks on fixed capital investment.	working capital to cash flow (WKS)
2013	Kieschnick, Laplante and Moussawi	3,786 US corporations	1990-2006	One dollar invested in the net operating capital is worth less than one dollar held in cash.	net working capital
2014	Baños-Caballero al.	non-financial companies, UK	2001-2007	Working capital shows an inverted U-shaped relationship to corporate performance. An optimal level of working capital can be found when trading off costs and benefits. This maximises firm performance.	net trade cycle
2014	de Almeida and Eid	182 Brazilian companies	1995-2009	Increasing levels of working capital investment reduces firms' value at the beginning of the fiscal year.	net working capital
2015	Aktas, Croci and Petmezas	15,541 large US firms	1982-2011	To maintain optimal levels by changing investments in working capital. This improves operating performance as well as share performance.	net working capital and the net working capital-to-sales ratio
2016	Afrifa	6,926 non-financial UK SMEs	2004-2013	Net working capital displays a significant concave correlation with firm performance. This relationship changes to convex when taking the cash flow variable into account.	net working capital

1

2.5 Trade Receivables and Trade Payables

Since working capital involves current assets and current liabilities, it can be divided into several specific short-term items, namely, cash, inventory, trade receivables and trade payables. Trade receivables (or accounts receivable), refers to the cash that needs to be collected from clients as a result of product sales or services, given on credit (Horngren et al., 2012). Trade receivables, as a control account, include the total amount of receivables from the individual client. These are generally due within 12 months. In contrast, the amounts owed (usually to be paid within 12 months) for products or services purchased on the account are trade payables.

Table 2.2 Operating and Cash Conversion Cycle

<table>
<tr><td colspan="2"><------------------------ Inventory period ------------------------></td><td><----------- Trade receivables period ------------></td></tr>
<tr><td><-------------- Trade payables Period ------------></td><td colspan="2"><--------------------- Cash conversion cycle --------------------></td></tr>
<tr><td colspan="3"><-- Operating cycle ---></td></tr>
</table>

Raw materials purchased	Payment for raw material	Sale of finished goods	Cash Collected on sales

Source: Brealey, Myers and Allen (2014)

Table 2.2 illustrates the operations of a simple business that purchases materials, processes them, and then sells these inventories on credit. The inventory period measures the time period between when the raw material was purchased and when it was sold. The period between the sales period and when the client pays for their goods, is called the trade receivables period. Similarly, the period between when the raw materials are purchased and the payment for these materials, is called the trade payables period. The total length of time between purchasing raw materials and receiving payments from the client is called the operating cycle. The interval between purchasing raw material and collecting payment from the customer is known as the firm’s cash conversion cycle (Brealey et al., 2014). The main difference between these factors is the time period.

Traditionally, firms prefer to maintain a short operating cycle, characterised by a shorter cash conversion cycle, a shorter inventory period, a shorter trade receivables period and a longer trade payables period. However, decreasing the cash conversion cycle can harm the firm’s operations and reduce profitability (Nobanee, 2009). Decreasing the inventory period may also lead to an inventory shortage. Likewise, shortening the receivables period could result in losing clients with good credit, just as lengthening the trade payables period may increase a firm’s credit risk. Therefore, it is necessary to maintain these periods at an optimal (certain) level.

As shown in Table 2.2, trade receivables and payables periods are very important in determining the levels of working capital and firm liquidity. However, trade receivables and payables are the opposite, based on their specific nature. This fact may provide some explanation for the concave relation between working capital and firm profitability which is discussed in section 2.3.2.

Under current assets, trade receivables are the most significant accounting item, following by cash.[10] Similarly, trade payables have great significance under current liabilities. Therefore, to further analyse whether working capital affects firm dividend payouts, we argue that it is necessary to examine both trade receivables and trade payables under working capital.

2.6 Working Capital and Dividend Payouts

Due to the high liquidity of working capital and its significant impact on firm performance, it is reasonable to assume that managers are able to control the working capital cycle, adjust desired cash levels, and re-distribute dividend payouts. Figure 2.2 shows how the working capital may affect dividend payout. Below we discuss two working capital scenarios.

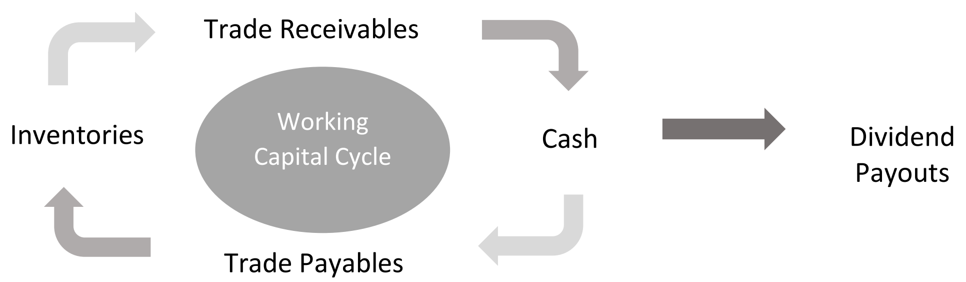


Figure 2.2 Theoretical Framework Showing Relationship between Working Capital and Dividend Payout

2.6.1 A Low Working Capital Scenario

Low (net) working capital levels may indicate that a firm has relatively low current assets and relatively high current liabilities. Specifically, firms with lower current assets suggest that cash, trade receivables, and inventories are at a low level, whereas higher current liabilities show that trade payables and other short-term debts are high. A low cash level may indicate that a firm’s cash conversion cycle is too long. This is not favourable for firms facing potential risks, as they may have liquidated assets to

[10] Inventory, as another important current asset, is not discussed here, because some of the firms drawn from the data sample do not have a physical inventory, such as firms in the financial sectors which count for around 20% of the total sample.

make payments (Opler et al., 1999; Mun and Jang, 2015). This suggests that the available cash level is too low. Low trade receivables indicate that a firm has collected payment from its customers/clients (Mun and Jang, 2015). Low inventories suggest that a firm has sold most of its products to reduce inventory holding costs (Alfares, 2007). High trade payables and other short-term debts reveal that a firm has a high amount of debt (that is due within a short period) to pay off. Therefore, either a lower level of current assets, or a higher level of current liabilities, demonstrates that a firm may have less cash and more obligations to clear. This is an obstacle for firms intending to issue cash dividends.

2.6.2 A High Working Capital Scenario

High (net) working capital levels may indicate that a firm has relatively high current assets and relatively low current liabilities. Higher current assets show that a firm's cash, trade receivables, and inventories are at a high level, whereas lower current liabilities show that trade payables and other short-term debts are low. On the one hand, a high cash level often indicates a positive cash flow, which facilitates future sales growth (Hill et al., 2010). Firms with higher cash grow faster and tend to have more investments and higher market to book ratio (Mikkelson and Partch, 2003). A high level of trade receivables suggests that a firm has extended into new markets and built strong supplier-customer relationships (Wilson and Summers, 2002). Holding considerable amounts of inventory can reduce supply costs and avoid loss of sales when demand is high (Blinder and Maccini, 1991; Fazzari and Petersen, 1993). On the other hand, low trade payables and other short-term debts, reveal that a firm has paid most of its debts due in a short period. Thus, we assume that relatively high working capital is a great potential source for dividend payouts.

However, when working capital is too high, the situation may change. A high level of trade receivables may suggest that more sales are on credit, which reflects a lack of cash as well as a potential credit risk (Bougheas et al., 2009; Martínez-Sola et al., 2013). Holding a large amount of inventory may indicate that products cannot be sold easily or most have been returned (Buzacott and Zhang, 2004). If a firm has considerable cash in its working capital, it may consider new investments, mergers and acquisitions (M&As), and R&D expenditure (Mikkelson and Partch, 2003), rather than issuing dividends. Alternatively, an extremely high working capital does not necessarily mean that a firm has considerable cash, but a greater level of trade receivables and a large amount of unsold inventory. Therefore, in either case, the firm may not be able to utilise working capital as a source for dividend payout, holding the current liabilities remain unchanged.

In summary, working capital appears to exhibit a concave impact on dividend payouts. We hypothesise that dividend payouts increase as working capital increases, until the working capital reaches a certain threshold level. It declines when working capital is beyond the threshold level. Understanding the link between working capital and dividend payout can provide critical information for payout policymakers. Therefore, trade-offs among short-term (for example, investment in business operations, R&Ds) and long-term financial decisions (such as dividend payouts and M&As) can help policymakers to design optimal payout policies.

2.7 Stock Dividends

There are no apparent costs associated with stock dividends or stock splits in the literature. In fact, dividend signalling theory suggests that these activities should not convey any information regarding future earnings. In order to test this hypothesis, Grinblatt et al. (1984) examined the announcement effects of stock dividends and splits in the US stock market from 1967 to 1976. They conclude that overall, stock prices are positively correlated with stock dividends, in which post-announcement returns are substantial for stock dividends around the ex-dates on the US Exchange. This implies that announcing a stock dividend option is seen by shareholders as a good sign (see also McNihols and Dravid, 1990; Bessembinder and Zhang, 2015). However, Lakonishok and Lev (1987), who report a decrease in the use of stock dividends, argue that they are used as a substitute by firms who are unable to issue cash dividends and thus are usually seen as a negative sign.

Lasfer (1997a) examined UK firms' motivations for paying a scrip dividend, for the period of 1987 to 1992.[11] The author found that stock dividends are not used to save on corporate tax and firms are less likely to issue stock dividends when they have insufficient cash or are facing financial difficulties. However, Lasfer (1997b) later revealed that the stock dividend option is driven by high rates of corporation tax, based on the majority of the respondents (managers). Lasfer found that shareholder pressure is the main reason firms offer stock dividends.

Wei and Xiao (2009) examined both cash dividends and stock dividends of listed firms on the Chinese stock market, from 1995 to 2006. Whilst shareholder preferences have been omitted in previous studies, they identify a new factor (equity ownership rights) as the shareholder preference to answer firms' dividend payout. They conclude that cash and stock dividends are negatively correlated, an argument which supports substitution theory. They argue that shareholders' different preferences on stock or cash dividends may result from the segregation of equity ownership rights, which leads to differences in share tradability. In particular, the amount of publicly traded shares has

[11] Scrip dividend is also known as stock dividend.

a positive impact on stock dividend payouts.

More recently, David and Ginglinger (2016) have argued that firms committed to paying dividends are more likely to offer an option for stock dividends when they may struggle to pay cash dividends. This option is common in times of economic recession or when there is a high gearing ratio. The authors found that abnormal stock returns after the announcement of a stock dividend option are positive. This finding suggests that options for stock dividends are seen as a positive option by shareholders, in spite of a decrease in cash dividends. However, Zhang and Kalay (2016) propose that investors initially overreact to stock dividend announcements, but gradually change their minds according to firms' (poor) performance. They also argue that purely stock dividends and options for stock dividends are inherently different; purely stock dividends provide limited insight into shareholder preferences (for cash or stock dividends).

2.8 Dividend Payouts during External Financial Shocks

Not surprisingly, the 2008 global financial crisis has been investigated by numerous economists. It has been described as the severest financial crisis since the great recession of the 1930s. The dramatic decreases in house prices after the collapse of the housing bubble in the US, impacted global markets. UK dividend payouts were negatively affected by the 2008 crisis. In 2007 the total dividend payout in the UK banking sector was £13.3 billion. In 2009 and 2010 it shrank to just £5.8 billion.[12]

Using dividend signalling theory, Bozos et al. (2011) tested the signalling effects of UK dividend announcements over four years (2006 to 2010), a period which includes both stable periods and periods of economic turmoil. By adopting the event study method, they observed positive abnormal returns around the dividend earnings announcements. On the one hand, their study reveals a negative relationship between external economic conditions and the dividend information content. On the other hand, they found changes in dividends conveyed less information during stable economic conditions and more in times of financial adversity.

Adreu and Gulamhussen (2013), who documented US bank holding firms' dividend payout, also support dividend signalling theory. They explain the dividend payout during the financial crisis. Based on a comparison of dividend payouts pre- and during crisis periods, they argue that external economic conditions (before and during the crisis) had a significant impact on dividend payouts. They found that large banks with low growth rates were more likely to pay more dividends both before and during the

[12] Source: www.theguardian.com/business/2013/feb/28/dividends-banks-halved-financial-crisis

crisis periods. Their findings also support agency theory. Moreover, Bildik et al. (2015) compared the US firms' dividend payouts with firms in another 32 countries, over the period of 1985 to 2011. They observed that while the proportion of dividend payers dropped dramatically from 1985 to 2000, it increased after 2000. This upward direction is statistically significant for the US firms. This indicates that the US acts as a leader in terms of payout trends. They also found that post-crisis payout ratios were higher than pre-crisis ones. Floyd et al. (2015) provide a comprehensive review of US bank and industrial firms' payout policies during a period of financial crisis (1980 to 2012). They observed that banks and industrials increased payouts before the financial crisis. In particular, industrials' dividend payouts increased sharply after 2002 when the declining propensity to pay reverses. Banks tend to have a more stable dividend payout policies and therefore were reluctant to cut dividend payouts before periods of financial crisis. The findings indicate that industrial payouts are more in line with free cash flow theory, while agency theory provides a better explanation for bank dividend payouts.

In contrast, Basse et al. (2014) found different results after analysing European banking industry dividend payouts from 1998 to 2008. They argue that decreasing/omitting dividends is one possible way to improve banks' financial performance (through retaining earnings). However, investors are more likely to interpret this as a signal of future problems. Considering these doubts, they examined European banks using both the dividend signalling theory and smoothing hypothesis. Using the VECM (vector error correction model), their results show no support for the investors' explanation. They concluded that the dividend signalling and smoothing hypothesis are not relevant under external economic conditions. Similarly, Al-Malkawi et al. (2014) used a Tobit model to examine dividend payouts in the Muscat Securities Market, from 2001 to 2010. They argue that the relationship between financial crisis and dividend payout is insignificant. They also found that firms continued to issue dividends even after periods of financial crisis.

Chapter 3 Research Methodology

3.1 Introduction

This chapter provides an overview of the data collection and research methods used to investigate the significance of working capital management on dividend payouts, determinants of stock dividends and dividend payouts under external shock conditions. Section 3.2 describes the panel (firm, sector and year) data collection. Section 3.3 outlines the variables and the measurements used in the empirical models. Section 3.4 provides the research model specifications (for both the cash and stock dividend models). Section 3.5 presents the rationale for selecting the Ordinary Least Squares (OLS), Fixed-Effects (FE), Random-Effects (RE), and Generalised Method of Moments (GMM) estimators. Section 3.6 provides a summary of the chapter.

3.2 Data Collection

The panel data in this study includes all of the publicly listed firms on the LSE, from 1991 to 2015. The sample firms (a total number of 1,575 firms) were drawn from the LSE in the *Bloomberg* Database. The sample firms include the following screening criteria:

1. Firms that have been actively trading on the LSE or other Stock Exchange markets (cross-listed) since 1990.
2. Firms that have paid dividends (cash dividends or stock dividends) continuously from 1990.

Most of the financial and accounting data were acquired on an annual basis, from the *Bloomberg* database and the LSE website. We used *World Bank* database to collect macroeconomic data at a country's level. The *World Bank* database provides information on Gross Domestic Product (GDP) growth and inflation rates. These variables were used to further test the external shock of financial crisis periods, in addition to the dummy year variable. Based on the Global Industry Classification Standard (GICS), we divided the listed firms into different sectors (Basic Materials, Consumer Goods, Consumer Service, Financials, Health Care, Industrials, Oil and Gas, Technology, Telecommunications and Utilities). Owing to missing information in the *Bloomberg* Database, we obtained a final sample consisting of 20,858 firm-year observations for the period of 1991 to 2015.

3.3 Variables Specification

3.3.1 Dependent Variables

3.3.1.1 Cash Dividend

We used the total common cash dividend payout (*Bloomberg* IS052) as one of our dependent variables. It is calculated as the dividend paid to common shareholders, from firm profits. This includes regular cash, as well as special cash dividends for all classes of common shareholders.[13] Following Aivazian et al. (2003) and Lee (2010), we multiplied cash dividends by 1,000 and scaled them down by dividing by the firm's total assets:

$$CD = \text{Total common cash dividends} \times 10^3 / \text{Total Assets} \quad \textbf{(3.1)}$$

We did not scale the cash dividends with net incomes for the following reasons:

1) The total common cash dividends variable has less missing values than the dividend payout ratio variable.
2) Some firm's net incomes are negative. If we scaled cash dividends with net incomes, it would yield negative ratios, which need to be removed from the analysis.

3.3.1.2 Stock Dividend

There are limited studies that document stock dividend payouts. Wei and Xiao (2009) used a ratio of stock dividend per share to EPS, sales per share, and stock price, to measure stock dividend payout. In this study, we define stock dividend payout to total payout ratio[14] as another dependent variable, which is expressed as:

$$SD = (\text{Total Payout} - \text{Total common cash dividend} - \text{Stock Repurchase}) / \text{Total Payout} \quad \textbf{(3.2)}$$

3.3.2 Testing of the Variables

[13] When dividends attributable to the periods are not disclosed, they are estimated by multiplying the dividend per share (*Bloomberg* IS151) by the weighted average number of outstanding shares (*Bloomberg* BS081).
[14] There is no direct stock dividend information on *Bloomberg*, such as the stock dividend per share. Therefore, we calculated stock dividend using the following formula. Stock dividend = total payout – cash dividend – stock repurchase.

3.3.2.1 Earnings

Dividend policy is essentially concerned with how much of a firm's earnings are paid to shareholders as returns. Earnings have become the most direct financial determinant to explain dividend payout. While there are many ways to report earnings (they vary according to different accounting principles), but the term corporate earnings typically refers to profits after tax, which equals total revenue minus the cost of sales, operating expenses, depreciations, other expenses, and corporate taxes.

Numerous studies have examined the relationship between earnings/profitability and dividend payout (see for example, Skinner, 2008; von Eije and Megginson, 2008; Fatemi and Bildik, 2012). These studies all measure earnings/profitability differently (via return on assets, net earnings after tax, and net income plus interest expenses). However, there is a potential problem with defining earnings in these ways. As discussed previously, the estimated coefficient (b) used in this earlier literature lacks accuracy (see Chapter 2 section 2.4). Rather than recalculating $\hat{b}$ based on the estimated b**,** the current study uses adjusted earnings (calculated as net income[15] after tax, minus the cash dividend declared), to measure the current earnings/profitability in order to improve our model efficiency. We calculate the dividend-adjusted earnings[16] as:

Divi-adj Earnings = (Net Income – Total Cash Preferred Dividend – Total Cash Common Dividend – Other Adjustments) / Total Assets **(3.3)**

3.3.2.2 Working Capital

Working capital measures a firm's efficiency and its short-term financial health. There are several ways to measure working capital management (see Table 2.1 in Chapter 2). As an inclusive measurement of working capital, the cash conversion cycle involves all of the current flows of inventory, trade receivables and trade payables (Nobanee, 2009). The cash conversion cycle (CCC) normally reports as the "number of days." However, the panel data we obtained are from an annual basis. Therefore, we use change in working capital (ΔWC) as a key explanatory variable.[17] It is calculated as follows:

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[15] Earnings available for common shareholders (net income) are not considered a cash item.

[16] For the purpose of comparing different coefficients across the subsamples, this variable is divided by total assets (as a ratio). Algebraically, this ratio equals the ROA, excluding shareholder payments.

[17] Change in working capital is used to capture the dynamic of working capital on dividend payout. Firms in different industries may report different changes in working capital. Working capital level (scaled down by total assets) is also used and the results are reported in the Robustness Check in the Appendices.

$$\Delta WC = \{\text{working capital (t)} - \text{working capital (t-1)}\} / \text{working capital (t-1)} \quad \textbf{(3.4)}$$

3.3.2.3 Trade Receivables and Trade Payables

To divide working capital management into more specific components, we tested the relationship between two variables (changes in trade receivables and trade payables) and cash dividend payouts. Apart from cash, the management of trade receivables and trade payables contribute the most significant portion of working capital management. As proposed earlier, trade receivables and trade payables are most likely to assist in opposing ways to firm cash dividend payouts. Therefore, trade receivables and trade payables are tested as two separate variables under the working capital hypothesis.

Trade receivables are receivables with a maturity of less than one year, and are directly related to operating activities. These receivables are the net amount of the provision for doubtful accounts; note receivables are not included. The change in trade receivables (ΔTR) is calculated as:

$$\Delta TR = \{\text{trade receivables (t)} - \text{trade receivables (t-1)}\} / \text{trade receivables (t-1)} \quad \textbf{(3.5)}$$

Trade payables are payables resulting from operating activities, which include trade payables to associates and related parties. In the UK, this includes payments received on account, land creditors for property investment firms, and consignment stock creditors for car dealerships. The change in trade payables (ΔTP) is calculated as:

$$\Delta TP = \{\text{trade payables (t)} - \text{trade payables (t-1)}\} / \text{trade payables (t-1)} \quad \textbf{(3.6)}$$

3.3.2.4 External Financial Shocks

A few studies (see Al-Malkawi et al., 2014; Attig et al., 2016) have used the dummy variable to capture the impact of the 2008 global financial crisis. We include both the 2008 global financial crisis and the 2012 UK double-dip recession in our model. A dummy variable Dum (fs) was created to measure the external financial shocks on firm dividend payouts:

$$\begin{aligned} \text{Dum (fs)} &= 1 \text{ (if the year equals to 2008 or 2012)} \\ &= 0 \text{ (otherwise)} \quad \textbf{(3.7)} \end{aligned}$$

where Dum (fs) equals 1 for the financial crisis period, and 0 for the non-financial crisis period.

3.3.3 Control Variables

3.3.3.1 Profitability

Following Alzahrani and Lasfer (2012), we also added earnings per share to control for firm profitability since firms with different EPSs may issue different dividend payouts. EPS includes the effects of all one-time, non-recurring and extraordinary gains/losses. It uses basic weighted average shares, excluding the effects of convertibles, and is computed as:

EPS = Net Income Available to Common Shareholders / Basic Weighted Average Shares Outstanding. **(3.8)**

According to FRS 3, the EPS calculation also includes extraordinary, abnormal, discontinued and one-off items for UK firms.[18]

Gordon (1963) has argued that high dividend payout decreases the cost of equity or the required rate of return on equity. We use this control variable when modelling stock dividend payouts. Return on common equity (ROE) measures a firm's profitability by revealing how much profit a company generates with the money shareholders have invested, in a percentage form:

ROE = Net income available for common shareholders × 100 / Average Total Common Equity **(3.9)**

3.3.3.2 Taxation

Overall, taxation has been considered a significant reason that leads to the decreasing of firms' dividend payout (see Lintner, 1956; Alzahrani and Lasfer, 2012; Jeong, 2013). In particular, Brittain (1964) notes that both individual and corporation taxes affect (negatively) firms' dividend payout. Other studies reveal the tax differences between capital gains and tax paid for dividends from an investor's perspective (Peterson et al., 1985; Pettit, 1976). However, in this study, we focus primarily on firm taxation. Therefore, we use Taxation (Tax) to indicate tax that has been paid and include it as a control variable. It is computed as the tax amount paid in cash, which includes actual cash paid for income taxes and net of any tax refunds.[19] Income tax is divided by total current liabilities:

Tax = Income tax paid in cash / total current liabilities **(3.10)**

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[18] Financial Reporting Standard 3-'Reporting Financial Performance' requires companies to include ALL items of cost and revenue in their EPS calculations. Before the adoption of FRS 3 (1993), EPS was calculated as: (net profit – preferred dividend)/average number of shares.

[19] Unless refunds exceed taxes paid, the number will be positive.

3.3.3.3 Investment

The relationship between investments and dividend decisions is far from conclusive. Bhaduri and Durai (2006) report a strong correlation between financing and investing decisions in an emerging market. Evidence also shows an insignificant correlation between investment and dividends (Fama, 1974; Gul, 1999; Wang, 2010). In order to control for shareholders' preferences for investments or dividends, we include total investments as another control variable. The total investment (Inv) consists of both long-term and short-term investments. These include marketable securities and other investments that are expected to convert to cash within, or after, one year. This also includes available for sale and held to maturity securities, classified as short-term and short-term interest-bearing loans to third parties, interest or dividends accrued on investments.[20] The total investments (Inv) are calculated as:

Inv = (Short-term investments + Long-term investments) / Total Assets **(3.11)**

3.3.3.4 Firm size

Firm size is an important determinant of firm dividend payout (see Faccio et al., 2001; Fama and French, 2001). Most studies use the logarithm of the book value of total assets when defining firm size (see Wei and Xiao, 2009; Breuer et al., 2014; Javakhadze et al., 2014). The test variables (working capital, trade receivables and trade payables) are included as part of the total assets. Thus we define firm size (size) as the logarithm of the book value of net sales (see Alzahrani and Lasfer, 2012) to avoid collinearity problems among the independent variables. It is computed as:

Size = Log (net sales) **(3.12)**

3.3.3.5 Gearing Ratio

Gearing ratio is often used to measure a firm's financial leverage, which is an effective financial indicator for revealing a firm's capital structure (Fridson and Alvarez, 2011). Gearing ratio is also an indicator of a firm's financial risk. We use long-term debt to common equity (gearing) to measure firm's financial leverage, which can be calculated by dividing its long-term debt (*Bloomberg* BS051) by common stockholders' equity (*Bloomberg* RP010), in percentage:

Gearing = Long-term debt × 100/ total common equity **(3.13)**

[20] In the UK, investment does not include 'held for resale' which are included in Other Current Assets.

3.3.3.6 Opportunity Growth

Following Denis and Osobov (2008), we use the market to book ratio as a proxy to measure firm growth opportunity. *Market-to-Book* (MtB)[21] is a measure of the relative value (*Bloomberg* RP010) of a firm compared to its market value (*Bloomberg* RP902). It is calculated as:

MtB = Market Capitalisation/ Book Value **(3.14)**

3.3.3.7 Stock Repurchase

Skinner (2008) has shown that firms use stock repurchases as a substitute for dividend payouts. The substitution hypothesis (Grullon and Michaely, 2002) also reveals that dividend and stock repurchase are negatively correlated. In other words, firms either choose to issue dividends or repurchase stocks. Stock repurchase is used as a control variable when modelling a stock dividend payout to test whether the substitution hypothesis between dividend and stock repurchase holds in our sample. The "decrease in capital stock" represents the repurchase (buyback) of common stock, common stock warrants, or other common stock equivalents. This includes redemption of preferred share capital and the purchase of treasury stock. We use the absolute value of the decrease in capital stock scaled by total assets:

Rep = ∣ decrease in capital stock ∣ / Total Assets **(3.15)**

3.3.3.8 Macroeconomic Factors

We add GDP growth and inflation rates to measure the macroeconomic conditions which can affect firm performance (McMillan, 2014).

3.4 Research Model

3.4.1 Cash Dividend Model

To examine the cash dividend payout, we begin with the classic model of dividend payout by Lintner (1956) who found that earnings are an important factor that changes dividend payout. The model is given as follows:

[21] Also known as price to book ratio, this is a financial ratio used to compare a firm's current market price to its book value.

$$\boldsymbol{D_{it} = a + bP_{it} + cD_{i(t-1)} + e_{it}} \tag{3.16}$$

where, D_{it} and $D_{i(t-1)}$ represents the dividend payout at time t and t-1, respectively, and P_{it} is the firm's profit after tax. This is one of the earliest models used to measure the relationship between earnings and dividend payouts.

To answer research objectives 1, 2 and 5, the current study includes variables used in Lintner's equation (3.16). Our model differs from Lintner's (1956) model, however, as we include adjusted earnings, denoted as dividend-adjusted earnings (profits after tax and after dividend declared). This enables us to mitigate the potential multicollinearity problem between the dependent variable (dividend) and earnings. We rebuild Afrifa's (2016) model and formulate the following equation:

$$\boldsymbol{CD_{it} = \beta_0 + \beta_1 CD_{i(t-1)} + \beta_2 \Delta WC^2{}_{it} + \beta_3 \Delta WC_{it} + \beta_4 Div - adj\ Earn_{it} + \beta_5 Tax_{it} + \beta_6 Inv_{it} + \beta_7 Gearing_{it} + \beta_8 MtB_{it} + \beta_9 Size_{it} + \beta_{10} Rep_{i(t-1)} + \beta_{11} Dum(fs)_{it} + \beta_{12} GDPg_{it} + \beta_{13} Inf_{it} + e_{it}} \tag{3.17}$$

where, CD_{it} and $CD_{i(t-1)}$ represent the cash dividend payout at times t and t-1, respectively, $\Delta WC^2{}_{it}$ and ΔWC_{it} are changes in working capital squared and changes in working capital at time period t, respectively. $Rep_{i(t-1)}$ is the stock repurchase at time period t-1 (last year's repurchase). The definition of variables for equation (3.17) is presented in Table 3.7.

To further explore how trade receivables and trade payables may affect firm dividend payouts, we split the variable ΔWC_{it} into ΔTP_{it} and ΔTR_{it} along with other control variables to answer research objectives 1, 3 and 5. The model can be expressed as follows:

$$\boldsymbol{CD_{it} = \beta_0 + \beta_1 CD_{i(t-1)} + \beta_2 \Delta TP_{it} + \beta_3 \Delta TR_{it} + \beta_4 Div - adj\ Earn_{it} + \beta_5 Tax_{it} + \beta_6 Inv_{it} + \beta_7 Gearing_{it} + \beta_8 MtB_{it} + \beta_9 Size_{it} + \beta_{10} Rep_{i(t-1)} + \beta_{11} Dum(fs)_{it} + \beta_{12} GDPg_{it} + \beta_{13} Inf_{it} + e_{it}} \tag{3.18}$$

where, ΔTP_{it} is the change in trade payables; ΔTR_{it} is the change in trade receivables, and $Rep_{i(t-1)}$ is the stock repurchase at time period t-1 (last year's stock repurchases). The definition of variables for equation (3.18) is presented in Table 3.7.

3.4.2 Stock Dividend Model

Unlike cash dividend analysis, stock dividend patterns are rarely discussed in the literature. Most of the dividend policy studies (Koch and Shenoy, 1999; Fukuda, 2000; Huang et al., 2011) either omit or exclude stock dividends or adjust other financial data in regard to stock dividends. We retain most of the explanatory variables in order to test whether the working capital variables are significant in our stock dividend model. To answer research objectives 4 and 5, our model follows equation (3.17). The stock dividend model can be expressed as follows:

$$\boldsymbol{SD_{it} = \beta_0 + \beta_1 SD_{i(t-1)} + \beta_2 \Delta WC^2{}_{it} + \beta_3 \Delta WC_{it} + \beta_4 ROE_{it} + \beta_5 EPS_{it} + \beta_6 Tax_{it} + \beta_7 Gearing_{it} + \beta_8 MtB_{it} + \beta_9 Size_{it} + \beta_{10} Rep_{i(t-1)} + \beta_{11} Dum(fs)_{it} + \beta_{12} GDPg_{it} + \beta_{13} Inf_{it} + e_{it}} \quad \textbf{(3.19)}$$

where, SD_{it} and $SD_{i(t-1)}$ are the stock dividend payouts at times t and t-1, respectively.

Similarly, we divide the change in working capital into the change in trade receivables and trade payables for our stock dividend model. However, we made several adjustments due to the natural differences between stock dividends versus cash dividends. Equation (3.19) can be rewritten as:

$$\boldsymbol{SD_{it} = \beta_0 + \beta_1 SD_{i(t-1)} + \beta_2 TP_{it} + \beta_3 \Delta TR_{it} + \beta_4 ROE_{it} + \beta_5 EPS_{it} + \beta_6 Tax_{it} + \beta_7 Gearing_{it} + \beta_8 MtB_{it} + \beta_9 Size_{it} + \beta_{10} Rep_{i(t-1)} + \beta_{11} Dum(fs)_{it} + \beta_{12} GDPg_{it} + \beta_{13} Inf_{it} + e_{it}} \quad \textbf{(3.20)}$$

Following Dittmar (2000), the first lag of stock repurchase is added into equations (3.19) and (3.20) to test the significance of the substitution hypothesis, between stock repurchase and stock dividend. It is noted that the current EPS would be affected by previous stock repurchases since stock repurchases decrease the number of shares outstanding, resulting in an increase in earnings per share.

Compared to equations (3.17) and (3.18), we remove Inv_{it} in equations (3.19) and (3.20). Earnings per share (EPS)[22] measures earnings as well as equity, therefore the dividend-adjusted earnings in equations (3.17) and (3.18) are removed as well. We also use ROE (return on shareholders' equity) to control for profitability.[23] The main reason for making these adjustments in equations (3.19) and (3.20) is that issuing a stock dividend is a channel for using equity finance. We believe that such adjustments, along with the retention of liabilities variables (such as gearing, which is an indicator of debt finance), may capture the impact of issuing stock dividends on a firm's capital structure. The definition of the variables for equations (3.17) and (3.18) are presented in Table 3.7.

[22] The current EPS would be affected by previous stock repurchases since stock repurchases decrease the number of shares outstanding, resulting in an increase in EPS.

[23] There are several accounting ratios for measuring firm profitability, including gross profit ratio, return on assets, and return on equity. Most of the dividend related literature adopts the ROA to control for firm profitability. Following Gordon (1962), Booth and Cleary (2003), ROE is used to measure the profitability of firms in our stock dividend models. Another reason is that stock dividends involve issuing additional shares. Such behaviour is more equity based.

3.5 Selection of Estimators

3.5.1 Diagnostic Test

3.5.1.1 Unit Root Test

Given the study's relatively large time period (25 years), it is necessary to test whether the data is stationary or not. We applied a Dickey-Fuller test to overcome spurious regressions. When nonstationary data is used in a regression model, the results may show apparently significant relationships from unrelated variables (Hill et al., 2012). This phenomenon is called spurious regression. Thus, the estimator and predictor obtained in the spurious regression do not have their usual properties, and the *t*-statistics are not reliable. Moreover, macroeconomic data are most likely nonstationary; for example, at least a part of their movement each quarter is random (Davidson et al., 2010).[24]

Table 3.1(a) Unit Root: Dickey-Fuller Test

	z statistics	*p*-value
Gearing (%)	-43.814	0.000***
ROE (%)	-42.126	0.000***
MtB (%)	-43.937	0.000***
EPS	-45.929	0.000***
Rep	-52.301	0.000***
Div-adj Earnings	-51.376	0.000***
ΔTP	-51.554	0.000***
ΔTR	-89.085	0.000***
CD	-40.209	0.000***
ΔWC	-56.701	0.000***
ΔWC^2	-57.184	0.000***
Tax	-47.169	0.000***
Inv	-50.114	0.000***
Size	-52.375	0.000***

*** represents significance at the 1% level
Source: Author's calculations

[24] Rapach (2002) found that macroeconomic variables, such as international real GDP and real GDP per capital levels are nonstationary.

Table 3.1(b) Unit Root: Phillips–Perron Test

	z statistics	*p*-value
GDPg (%)	-3.382	0.026**
Inf (%)	-4.023	0.00***

** and *** represent significance at 5% and 1% levels, respectively
Source: Author's calculations

It is necessary to determine whether our time series data are stationary or not. There are several tests we can use to check for stationarity. In this study, we used both the Dickey-Fuller test (1979), and the Phillips-Perron test (1988). The results are shown in Tables 3.1(a) and (b).[25]

Based on the Dickey-Fuller test (1979), we examined most of the variables using the Fisher-type unit-root test for the unbalanced panel data in our study. The null hypothesis assumes that all panels contain unit roots, while the alternative hypothesis argues that at least one panel is stationary. Similarly, under the Phillips–Perron test (1988), the null hypothesis claims that the variable contains a unit root. The alternative hypothesis is that the variable is stationary. We adopted the Phillips–Perron test (1988) for GDP growth and inflation rates and the Dickey-Fuller test (1979) for the remainder of the variables.

We report the results in Table 3.1. All of the p-values of inverse normal Z statistics are zero (insignificant at the 1% level) under the Dickey-Fuller test (1979). The GDPg and Inf report a *z*-statistic of -3.382 (insignificant at the 5% level) and -4.023 (insignificant at the 1% level), respectively. Therefore, we reject the null hypothesis and accept that the variables are stationary.

3.5.1.2 Multicollinearity Test

Multicollinearity is a state of a very strong intercorrelation between two or more independent variables (Albright et al., 2016). In other words, multicollinearity occurs when two or more variables contain much of the same information. The presence of disturbance in the data and results interpretations may not be reliable.

Table 3.2 (a) and (b) report the correlation matrix for cash and stock dividend models, respectively.[26] Table 3.2 (a) shows the correlation coefficients among the variables are below 0.5, except for the correlation between CD and CD (t-1), which is 0.8072 (greater than 0.5). This indicates

[25] Annual GDP growth and inflation rate repeat in multiple panels. Therefore, we adopted the Phillips-Perron test which is more efficient than the Dickey-Fuller test to check the unit root in one panel.
[26] See Table 3.7 for definitions of the abbreviated variables.

that the current cash dividend payout can be affected by previous cash dividend payouts (dynamic relation). Similarly, we find that the correlation between SD and SD (t-1) is 0.6931 (as seen in Table 3.2 (b)). This implies that the stock dividend also has a dynamic relationship.

The correlation matrices in Table 3.2 (a) and (b) are helpful to detect a multicollinearity problem in our dataset, but do not necessarily indicate that multicollinearity exists (Leech et al., 2014). We adopted the Variance Inflation Factor (VIF) and Tolerance for all of the independent variables in both cash and stock dividend models.[27] The results are shown in Tables 3.3 (a) and (b). Larger VIF values show a greater variance in the regression weight of that variable. Multicollinearity is detected for a particular variable if the VIF value is greater than 10. Alternatively, if the tolerance value of a variable is 0.01 or less, it suggests multicollinearity exists (Meyers et al., 2016). Each VIF value is smaller than 10, and the Tolerance (1/VIF) value is greater than 0.1 in both tables. Thus, between the results shown in the correlation matrices and the VIF tests, we can safely conclude that there is no multicollinearity issue in our data.

3.5.1.3 Heteroscedasticity Test

The homoscedasticity assumption of general OLS regression states that the variance of the unobserved error term u_{it}, based on the explanatory variables, is constant over time, across individuals, firms and countries (Wooldridge, 2010). The standard errors of general OLS are not valid for constructing confidence intervals and *t*-statistics if the data has heteroscedasticity problems. *F*-statistics are not reliable since they are not *F* distributed, similar to the Chi-square distribution which is asymptotic if heteroscedasticity is present. According to the Gauss-Markov Theorem, OLS is best linearly unbiased if all the assumptions (MLR.1 to MLR. 5) hold. If it violates the homoscedasticity assumption, then OLS is no longer BLUE (best linear unbiased estimator) (Wooldridge, 2015).

In this study, the Breusch-Pagan test (1979), the Cook-Weisberg test (1983) and the White test (1980) for heteroscedasticity were used to examine whether the error term u_{it} was constant or not. These results are reported in Tables 3.4 (a) and (b). The null hypothesis of the Breusch-Pagan/Cook-Weisberg test claims that the variance of the unobserved error term has a constant variance. The Chi-square reports a value of 9467.67, with a p-value of 0.000, which suggests that the null hypothesis is strongly rejected. Under White's test, the null hypothesis argues that the disturbances are homoscedastic. Similarly, Chi-square reports a value of 2,012.24 which is significant at the 1% level.

[27] VIF measures multicollinearity: VIF = 1/ (1-R^2) and Tolerance is another measurement used to test multicollinearity: Tolerance = 1/ VIF.

These results suggest that heteroscedasticity exists.[28]

One widely applied solution to the heteroscedasticity issue is known as Heteroscedasticity-Robust procedures, under which standard errors can be adjusted, so that general OLS estimates are valid in the presence of heteroscedasticity of unknown forms (Wooldridge, 2015).[29] Adopting this Heteroscedasticity-Robust method, whether the disturbances have a constant variance or not, in a large sample, means that this is not an issue; thus the general OLS estimates are valid.

3.5.1.4 Serial Correlation Test

One assumption (MLR. 5) of the Classic Linear Model is that there is no autocorrelation in the error term. It means that the error terms in two different periods are not correlated with each other conditional on X: $Corr(u_{it}, u_{is}|X) = 0$, for all t ≠ s. When this fails, the errors in the classic linear model suffer from serial correlation, or autocorrelation (Wooldridge, 2015). Baltagi (2008) argues that the condition of no serial correlation can be restrictive and unrealistic in cross sectional data and it is unrealistic when the error term in the previous period can affect the current one.

If the serial correlation occurs, the Classic Linear Model estimation is still consistent, but less efficient, because of the downwardly biased standard errors (Wooldridge, 2015). In order to obtain unbiased results, Drukker (2003) suggests that the first step is to identify serial correlation in the idiosyncratic error term in a panel data model. In the current study, we adopted the Wooldridge test (Drukker, 2003; Wooldridge, 2010) to check for autocorrelation in our panel data model (equations (3.17) and (3.18)). The results are reported in Tables 3.5 (a) and (b). According to the Wooldridge tests, the small p-values indicate that the null hypothesis of no first-order autocorrelation is strongly rejected. In other words, there are serial correlation issues with the error terms in our data.[30]

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[28] In the stock dividend model, the White Test shows that there is no heteroscedasticity issue.

[29] All the regression results in Chapter 4 are based on the heteroscedasticity-robust procedures, thus all the reported standard errors are shown in robust standard errors.

[30] In the stock dividend model, the Wooldridge Test for autocorrelation reports an *F*-test of 3.580 and *p*-value of 0.0706. This indicates that there is no serial correlation issue at the 5% significance level, while the serial correlation issues (in cash dividend) were resolved in the m_2 (second-order autocorrelation) test when we used the system GMM estimator. These results are presented in Chapter 4.

Table 3.2 (a) Correlation Matrix for the Cash Dividend Model

	CD	CD(t-1)	ΔWC	ΔTP	ΔTR	Div-ajd Earn	Tax	Inv	Size	Gearing	MtB	Rep(t-1)	Dum(fs)	GDPg	Inf
CD	1.000														
CD(t-1)	0.807	1.000													
ΔWC	-0.020	-0.034	1.000												
ΔTP	-0.063	-0.045	0.054	1.000											
ΔTR	-0.081	-0.077	0.041	0.308	1.000										
Div-adj Earn	0.200	0.219	0.015	-0.019	-0.048	1.000									
Tax	0.385	0.375	-0.011	-0.034	-0.059	0.257	1.000								
Inv	0.016	0.013	0.032	0.035	0.021	-0.017	-0.008	1.000							
Size	0.274	0.274	-0.039	-0.114	-0.146	0.347	0.233	-0.047	1.000						
Gearing	-0.023	0.002	-0.010	-0.034	-0.044	0.024	-0.012	-0.037	0.258	1.000					
MtB	0.255	0.231	0.016	0.018	0.030	-0.132	0.023	0.034	0.024	0.323	1.000				
Rep(t-1)	0.194	0.201	-0.003	0.000	0.004	0.041	0.111	0.020	0.098	0.060	0.159	1.000			
Dum(fs)	-0.037	-0.023	-0.016	-0.011	-0.022	-0.041	0.012	-0.014	-0.012	0.019	-0.072	0.032	1.000		
GDPg	0.066	0.054	0.014	0.029	0.028	0.040	0.015	0.022	0.031	-0.026	0.073	-0.018	-0.317	1.000	
Inf	-0.037	-0.030	-0.015	-0.003	0.005	0.024	-0.031	-0.022	-0.001	-0.007	-0.063	-0.010	0.351	-0.324	1.000

The correlation coefficient is calculated as: $\mathrm{p} = \sum(\mathrm{var1} - \overline{\mathrm{var1}})(\mathrm{var2} - \overline{\mathrm{var2}}) / \sqrt{\sum(\mathrm{var1} - \overline{\mathrm{var1}})^2 \sum(\mathrm{var2} - \overline{\mathrm{var2}})^2}$

Source: Author’s calculations

Table 3.2 (b) Correlation Matrix for the Stock Dividend Model

	SD	SD(t-1)	ΔWC	ΔTP	ΔTR	ROE	EPS	Tax	Size	Gearing	MtB	Rep(t-1)	GDPg	Inf
SD	1.000													
SD(t-1)	0.693	1.000												
ΔWC	0.053	0.112	1.000											
ΔTP	0.026	-0.075	-0.008	1.000										
ΔTR	-0.111	-0.141	0.044	-0.134	1.000									
ROE	-0.010	0.074	-0.021	0.001	-0.029	1.000								
EPS	-0.385	-0.276	0.005	0.096	-0.136	0.352	1.000							
Tax	-0.281	-0.294	0.026	0.092	-0.093	0.289	0.130	1.000						
Size	-0.590	-0.606	0.143	0.007	0.062	0.026	0.157	0.044	1.000					
Gearing	0.052	-0.065	0.148	-0.032	0.052	0.400	0.063	-0.196	0.203	1.000				
MtB	-0.043	-0.049	-0.009	0.112	-0.050	0.898	0.469	0.309	0.029	0.500	1.000			
Rep(t-1)	-0.124	0.038	0.017	0.158	-0.039	0.170	0.382	0.086	-0.006	0.002	0.243	1.000		
GDPg	-0.138	-0.168	-0.096	0.069	0.109	-0.060	0.058	-0.048	0.144	-0.100	-0.073	-0.022	1.000	
Inf	-0.113	-0.119	-0.186	-0.067	-0.027	-0.131	-0.007	-0.052	0.229	-0.071	-0.127	-0.210	0.253	1.000

The correlation coefficient is calculated as: $\mathrm{p} = \sum(\mathrm{var1} - \overline{\mathrm{var1}})(\mathrm{var2} - \overline{\mathrm{var2}} / \sqrt{\sum(\mathrm{var1} - \overline{\mathrm{var1}})^2 \sum(\mathrm{var2} - \overline{\mathrm{var2}})^2}$

Source: Author's calculations

Table 3.3 (a) Variance Inflation Factor (VIF) for the Cash Dividend Model

Variable	VIF	1/VIF
ΔWC	2.570	0.389
ΔWC^2	2.570	0.389
CD(t-1)	1.420	0.707
Size	1.300	0.767
MtB (%)	1.250	0.799
Tax	1.240	0.808
Div-adj Earnings	1.220	0.820
Dum (fs)	1.220	0.821
Inf	1.210	0.824
Gearing (%)	1.180	0.849
GDPg	1.170	0.853
ΔTR	1.100	0.907
ΔTP	1.100	0.910
Rep(t-1)	1.070	0.933
Inv	1.010	0.990
Mean VIF and 1/VIF	1.380	0.784

Dependent variable: CD (Cash Dividend).
Source: Author’s calculations

Table 3.3 (b) Variance Inflation Factor (VIF) for the Stock Dividend Model

Variable	VIF	1/VIF
ΔWC	4.480	0.223
ΔWC^2	4.340	0.230
ROE (%)	3.440	0.290
Rep(t-1)	2.010	0.497
SD(t-1)	2.000	0.499
MtB (%)	1.970	0.509
EPS	1.940	0.515
Gearing (%)	1.880	0.531
Tax	1.520	0.657
Size	1.320	0.757
Inf	1.220	0.822
GDPg	1.210	0.828
Dum(fs)	1.170	0.852
ΔTP	1.100	0.906
ΔTR	1.030	0.968
Mean VIF and 1/VIF	2.040	0.606

Dependent variable: SD (Stock Dividend).
Source: Author’s calculations

Table 3.4 (a) Heteroscedasticity Test for Equation (3.17)

Source	SS	df	MS	
Model	8169885.200	13	628452.708	Number of obs = 14,221
Residual	3987975.020	14,207	280.705	F(13, 14207) = 2238.84
Total	12157860.200	14,220	854.983	Prob > F = 0.0000
				R-squared = 0.6720
				Adj R-squared = 0.6717
				Root MSE = 16.754

CD	Coef.	R S. Err.	t	P>|t|	[95% Conf.Interval]	
CD(t-1)	0.739	0.006	129.720	0.000	0.728	0.750
ΔWC^2	-0.012	0.004	-2.910	0.004	-0.021	-0.004
ΔWC	0.232	0.075	3.100	0.002	0.085	0.379
Div-adj Earnings	1.813	0.580	3.130	0.002	0.676	2.950
Tax	23.639	1.358	17.410	0.000	20.978	26.300
Inv	1.659	1.859	0.890	0.372	-1.985	5.304
Gearing	-0.022	0.002	-12.940	0.000	-0.026	-0.019
MtB	0.692	0.037	18.820	0.000	0.620	0.765
Size	0.682	0.058	11.750	0.000	0.568	0.796
Rep(t-1)	27.895	8.536	3.270	0.001	11.163	44.627
Dum(fs)	-0.590	0.470	-1.260	0.209	-1.510	0.331
GDPg	0.216	0.084	2.570	0.010	0.052	0.381
Inf	-0.020	0.140	-0.140	0.889	-0.293	0.254
Constant	0.577	0.477	1.210	0.227	-0.358	1.511

Breusch-Pagan/Cook-Weisberg test for heteroscedasticity
H_0: Constant variance
Variables: fitted values of CD
chi2(1) = 9467.67
Prob > chi2 = 0.000***

White's test for H_0: homoscedasticity
against H_a: unrestricted heteroscedasticity
chi2(101) = 2012.24
Prob > chi2 = 0.000***

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroscedasticity	2012.240	101.000	0.000***
Skewness	463.940	13.000	0.000***
Kurtosis	107.660	1.000	0.000***
Total	2583.830	115.000	0.000***

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

Table 3.4 (b) Heteroscedasticity Test for Equation (3.18)

Source	SS	df	MS	
Model	7109029	13	546848.408	Number of obs = 12,274
Residual	3444214	12,260	280.931023	F(13, 12260) = 1946.56
Total	10553244	12,273	859.874818	Prob > F = 0.0000
				R-squared = 0.6736
				Adj R-squared = 0.6733
				Root MSE = 16.761

CD	Coef.	R S. Err.	t	P>|t|	[95% Conf.Interval]	
CD(t-1)	0.735	0.006	119.910	0.000	0.723	0.747
ΔWC^2	-0.543	0.133	-4.070	0.000	-0.804	-0.281
ΔWC	-0.196	0.103	-1.900	0.058	-0.398	0.007
Div-adj Earnings	1.285	0.688	1.870	0.062	-0.063	2.633
Tax	24.428	1.546	15.800	0.000	21.398	27.458
Inv	2.045	2.245	0.910	0.362	-2.356	6.446
Gearing	-0.026	0.002	-13.140	0.000	-0.029	-0.022
MtB	0.733	0.040	18.220	0.000	0.654	0.811
Size	0.708	0.068	10.350	0.000	0.574	0.842
Rep(t-1)	35.112	9.109	3.850	0.000	17.257	52.966
Dum(fs)	-0.757	0.514	-1.470	0.141	-1.766	0.251
GDPg	0.200	0.092	2.180	0.029	0.020	0.381
Inf	0.023	0.153	0.150	0.880	-0.277	0.323
Constant	0.610	0.544	1.120	0.262	-0.455	1.676

Breusch-Pagan/Cook-Weisberg test for heteroscedasticity
H_0: Constant variance
Variables: fitted values of CD
chi2(1) = 7860.96
Prob > chi2 = 0.000***

White's test for H_0: homoscedasticity
against H_a: unrestricted heteroscedasticity
chi2(102) = 1806.34
Prob > chi2 = 0.000***

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroscedasticity	1806.34	102	0.000***
Skewness	414.57	13	0.000***
Kurtosis	90.95	1	0.000***
Total	2311.86	116	0.000***

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author’s calculations

Table 3.5 (a) Serial Correlation Test for Equation (3.17)

CD	Coef.	R Std. Err.	t	P>|t|	[95% Conf.Interval]	
lag2 CD	-0.256	0.021	-12.230	0.000	-0.297	-0.215
lag ΔWC^2	-0.001	0.003	-0.450	0.656	-0.007	0.004
lag ΔWC	0.034	0.046	0.750	0.453	-0.056	0.125
lag Div-adj Earnings	-4.907	1.688	-2.910	0.004	-8.217	-1.596
lag Tax	15.892	2.224	7.150	0.000	11.528	20.255
lag Inv	0.994	3.003	0.330	0.741	-4.898	6.886
lag Gearing	-0.016	0.003	-5.400	0.000	-0.022	-0.010
lag MtB	0.216	0.070	3.070	0.002	0.078	0.354
lag Size	0.516	0.259	1.990	0.047	0.007	1.025
lag2 Rep	-6.266	10.746	-0.580	0.560	-27.349	14.816
lag Dum(fs)	-0.081	0.297	-0.270	0.784	-0.664	0.502
lag GDPg	0.474	0.077	6.190	0.000	0.324	0.625
lag inf	-0.899	0.149	-6.030	0.000	-1.192	-0.606

Wooldridge test for autocorrelation in panel data

H_0: no first-order autocorrelation

F(1, 1070) = 354.180

Prob > F = 0.000***

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations

Table 3.5 (b) Serial Correlation Test for Equation (3.18)

CD	Coef.	R Std. Err.	t	P>|t|	[95% Conf.Interval]	
lag2 CD	-0.253	0.022	-11.740	0.000	-0.295	-0.211
lag ΔTP	-0.198	0.137	-1.440	0.150	-0.467	0.072
lag ΔTR	-0.001	0.068	-0.010	0.992	-0.134	0.133
lag Div-adj Earnings	-7.031	2.343	-3.000	0.003	-11.628	-2.434
lag Tax	19.077	2.640	7.230	0.000	13.896	24.259
lag Inv	0.152	4.367	0.030	0.972	-8.417	8.720
lag Gearing	-0.019	0.004	-5.090	0.000	-0.026	-0.012
lag MtB	0.284	0.082	3.450	0.001	0.123	0.445
lag Size	0.713	0.414	1.720	0.085	-0.099	1.526
lag2 Rep	-4.663	11.642	-0.400	0.689	-27.508	18.182
lag Dum(fs)	-0.106	0.346	-0.310	0.760	-0.784	0.573
lag GDPg	0.462	0.084	5.490	0.000	0.297	0.627
lag inf	-0.962	0.164	-5.850	0.000	-1.285	-0.640

Wooldridge test for autocorrelation in panel data

H_0: no first-order autocorrelation

F(1, 917) = 303.729

Prob > F = 0.000***

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations

3.5.2 Dividend Payout: A Dynamic Relationship

Lintner's (1956) classic model of dividend payout (equation (3.16)) suggests that a firm's dividend payout Div_{it} or change in dividend ΔDiv_{it} is a function of current earnings P_{it} and last year's dividend payout (the lag of dividend $Div_{i(t-1)}$). Following Lintner (1956), a number of dividend payout studies also reveal that the dependent variable Div_{it} is significantly affected by its lag value $Div_{i(t-1)}$ (see also Fama and Babiak, 1968; Aharony and Swary, 1980; von Eije et al., 2008; Javakhadze et al., 2014). Therefore, the literature has shown that dividend payout is most likely affected by its lag value, which suggests that it has a dynamic relationship.

Table 3.6 Static Model versus Dynamic Model

	General OLS	Dynamic OLS	General FE	Dynamic FE
R^2	28.35%	67.20%	6.96%	27.24%
Root MSE	24.761	16.754	n.a.	n.a.
Dividend payout(t-1)	not included	0.000***	not included	0.000***

Note: The static model (general OLS and FE) is based on the equation: $\boldsymbol{D_{it} = a_{it} + b\sum X_{it} + e_{it}}$; while the dynamic model (dynamic OLS and FE) is shown as: $\boldsymbol{D_{it} = a_{it} + bD_{i(t-1)} + b\sum X_{it} + e_{it}}$. The R^2 reported in the Fixed-Effects models are with-in R^2.
*, ** and *** represents significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

Empirically, we applied the general OLS and FE estimators to the "static" model as well as the "dynamic" model.[31] Table 3.6 reports the partial results for the static and dynamic models.

As observed, the R^2 rises from 28.35% in the general OLS model to 67.20% in the dynamic OLS model. The within R^2 also increases dramatically from 6.96% in the normal Fixed-Effects model to 27.24% in the dynamic fixed-effects model. Similarly, the root MSE (the root of the Mean Sum of Squares) indicates that the dynamic OLS model is more accurate and has fewer errors. Apart from a significant increase in R^2 and within R^2 from the static model to the dynamic model, the coefficient of lag dividend payout reports a positive and significant sign in both dynamic OLS and dynamic FE model. These results suggest that the dividend payout has a dynamic relationship.

3.5.3 *F*-test and Hausman-test

To test whether the dynamic OLS or FE model is adequate or not, we adopted the *F*-test. Consider the unobserved fixed effects u_{it} in the dynamic FE model:

[31] The full results of the static and dynamic models are available upon request.

$$\boldsymbol{Div_{it} = a_{it} + bDiv_{i(t-1)} + c\sum X_{it} + u_{it} + e_{it}} \quad \textbf{(3.21)}$$

Where Div_{it} and X_{it} represent the dividend payout and explanatory variables, respectively. e_{it} is a random error term.

The null hypothesis of the *F*-test argues that the observed and unobserved fixed effects u_{it} are equal to zero. The alternative hypothesis claims that the fixed effects are non-zero. The F-test is automatically reported at the bottom of the fixed effect regression output via using the "xtreg, fe" command in Stata. The *F*-test results are shown as follows in our dynamic FE model:

"*F* test that all ui=0: *F* (1289, 12918) = 3.31, Prob > *F* = 0.0000"

As observed, the F-test displays a figure of 3.31 which is significantly (p-value less than 0.01) different from zero. Therefore, we reject the null hypothesis and conclude that the dynamic FE model is more appropriate than the dynamic OLS model.

The Hausman-test (1978) shows a chi2 (13) of 962.23 when comparing the dynamic FE model with the dynamic RE model. The *p*-value is 0.000, which indicates rejection that the individual-level effects are adequately modelled by a dynamic RE model. In other words, the dynamic FE model is more appropriate for our study.

3.5.4 Endogeneity

As Alison (2009) argues, FE discards potentially between-individual variation. The FE adopts only within variation to estimate the causal effect based on one assumption that the within variation is exogenous. As shown in equation (3.21), a weak exogenous is $E(u_{it}|X_{it}) = 0$, and a strict exogenous requires $E(u_{it}|X_{is}) = 0$, s=t, ∀s. If either of these assumptions does not hold ($E(u_{it}|X_{it}) \neq 0$, or $E(u_{it}|X_{is}) \neq 0$, s=t, ∀s), then endogeneity occurs. The endogeneity issue can result from simultaneity and unobserved heterogeneity which leads to a FE estimation bias (Wooldridge, 2010).

Simultaneity occurs when $E(e_{it}|D_{it}, X_{it}) \neq 0$. It indicates not only that the explanatory variables have an impact on dividend payouts, but also that the firms' historical dividend payout also affects the explanatory variables. According to the literature, these variables can be earnings,[32] leverage (Crutchley and Hansen, 1989), investments (Dhrymes and Kurz, 1967; Bhaduri and Durai, 2006), and stock repurchases (Asquith and Mullins, 1986; Grullon and Michaely, 2002). If simultaneity exists, then the OLS and the FE estimator are biased (Wintoki et al., 2012). A possible solution to simultaneity is to estimate the effect of the explanatory variables (for example, stock repurchases) on dividend payouts

[32] See also the Dividend Signalling Theory in Chapter 2

via the simultaneous equation models (Gujarati, 2004). In the first equation, it measures dividend payouts with stock repurchases and other control variables; while the second equation estimates stock repurchases with dividend payouts and other control variables (Gujarati, 2004). However, using this method requires strict exogenous instruments which are difficult to identify (Wintoki et al., 2012).

An unobservable heterogeneity exists if $E(u_{it}|X_{it}, Z_{it}) \neq 0$ which can result in endogeneity issues if there are unobservable factors that affect both the dividend payout and the explanatory variables. According to Wintoki et al. (2012), the fixed part or the time-invariant of unobserved heterogeneity can be resolved by adopting the normal FE estimator. Considering the following linear model:

$$\boldsymbol{D_{it} = a + bX_{it} + u_{it} + e_{it}} \qquad \textbf{(3.22)}$$

The FE transformation requires time-demeaning all variables and yields:

$$\boldsymbol{\ddot{D}_{it} = a_{it} + b\ddot{X}_{it} + e_{it}} \qquad \textbf{(3.23)}$$

Where $\ddot{X}_{it} = X_{it} - \bar{X}_{it}$ and $\ddot{D}_{it} = D_{it} - \bar{D}_{it}$. However, Wooldridge (2010) argues that the normal FE estimator would result in potential bias in a dynamic relationship:

$$\boldsymbol{\frac{1}{T}\sum_{t-1}^{T} E(X'_{it}, e_{it}) = -\frac{1}{T}\sum_{t-1}^{T} E(\bar{X}'_{i}, e_{it}) = -E(\bar{X}'_{i}, \bar{e}'_{i})} \qquad \textbf{(3.24)}$$

Equation (3.24) indicates that the FE estimator of D_{it} on the X_{it} will be biased when the explanatory variable X_{it} is correlated with its lag value $X_{i(t-1)}$. Further, Wintoki et al., (2012) proved that the FE estimator could generate spurious results even if the explanatory variable X_{it} has no causal relationship with the dependent variable D_{it}.

Roberts and Whited (2013) suggest that it is necessary to discuss the primary endogeneity concern in Corporate Finance studies, which many researchers have failed to do in the existing dividend literature. It is difficult to address whether the variable(s) are strictly exogenous or not in a dividend payout without first understanding it. Nevertheless, if the endogeneity issue exists (with a high probability in Corporate Finance), then the dynamic FE estimator would yield spurious results. Thus, FE estimator's reliability is challenged. Advanced estimators are used to overcome these issues.

3.5.5 Dynamic GMM Estimator

In previous sections, we have shown that the traditional/dynamic OLS and FE model does not address potential endogeneity issues. The standard approach for resolving serial correlation or endogeneity issue is using Instrumental Variables (IVs). These instrumental variables are the variable(s) that must not be correlated with the error term, but correlated with the explanatory variables. Several estimation techniques, using instrumental variables, are available, including 2 Stage Least Squares (2SLS), Maximum Likelihood, and Generalised Method of Moments (GMM).[33]

In this study, the panel data obtained are more applicable for Generalised Method of Moments (GMM) estimates. According to Roodman (2009), the reasons are as follows:

1. When exploring dividend payout, the process is most likely to be dynamic. Lintner's (1956) study on dividend payouts found that that lagged values influence the dependent variable.
2. There may be arbitrarily distributed fixed individual effects.
3. Some independent variables are most likely to be endogenous, such as Investment, Stock Repurchase, Market-to-Book and Gearing ratios in our model.
4. The idiosyncratic disturbances may have individual-specific patterns of heteroscedasticity and serial correlation.
5. The idiosyncratic disturbances are uncorrelated across individuals.
6. Some repressors can be predetermined but are not strictly exogenous; in our case, the lagged cash dividend payout variable.
7. The number of time periods in the data, "T" may be small. In our data set, "T" is 25 which is a relatively high period compared to other studies, but "N" is as large as 1,575.
8. The only available instruments are "internal." While previous literature on dividend payout provides some information on appropriate instruments, finding a suitable instrument is difficult.

Holtz-Eakin et al. (1988), Arellano and Bond (1991), and Arellano and Bover (1995) introduced the dynamic GMM estimator for panel data. The estimator has two essential steps. First, the first difference of regression and instruments are used to control the unobserved effects. Second, the previous explanatory variables and lagged dependent variables are used as instruments (Loayza et al., 2004). The general dynamic dividend payout model is as follows:

$$\boldsymbol{D_{it} = a_{it} + bD_{i(t-1)} + cX_{it} + u_i + e_{it}} \qquad \textbf{(3.25)}$$

To remove the firm-specific effects, the first difference of equation (3.25) is taken, and the transformed equation is given as:

$$\boldsymbol{D_{it} - D_{i(t-1)} = a_{it} - a_{i(t-1)} + b\left[D_{i(t-1)} - D_{i(t-2)}\right] + c[X_{it} - X_{i(t-1)}] + [e_{it} - e_{i(t-1)}]} \qquad \textbf{(3.26)}$$

The instruments were added to address the potential endogeneity issue of the explanatory variables. The error term after the first difference transformation $e_{it} - e_{i(t-1)}$ is correlated to the lag

33 We also used the 2SLS and Quasi-Maximum Likelihood (QML) to estimate our models, but the results were not significant. These results are available upon request.

change in dividend payout $D_{i(t-1)} - D_{i(t-2)}$. The previous observations of the explanatory variable and lag change in dividend payout are included in the instruments. The current and future values of the explanatory variables are influenced by the error terms, only because the lagged values are used as instruments. The instrument variables do not allow the explanatory variables to be strictly endogenous. Therefore, the strict exogeneity assumption is relaxed.

Based on the assumptions of there is no serial correlation in the error terms e_{it}, and the explanatory variables X_{it} are not strictly exogenous, the GMM dynamic estimator adopts the following moment conditions:

$$\boldsymbol{E\{D_{i(t-m)} \cdot [e_{it} - e_{i(t-1)}]\} = 0, for\ m \geq 2, t = 3,4,5 \dots, T} \quad \textbf{(3.27)}$$

$$\boldsymbol{E\{X_{i(t-m)} \cdot [e_{it} - e_{i(t-1)}]\} = 0, for\ m \geq 2, t = 3,4,5 \dots, T} \quad \textbf{(3.28)}$$

The GMM, based on these conditions, is called Difference GMM. However, Blundell and Bond (1998) argue that lagged variables are weak instruments for the transformed equation in differences, in both short sample periods and persistent series. Roodman (2009) shows that the Difference GMM estimation is biased in finite samples because the first-differenced transformation enlarges variances in unbalanced panels. To improve the model's efficiency, the System GMM estimator, which combines the regression in differences, as well as the regression in level, is introduced. System GMM requires additional assumptions. Despite the fact that the correlation between the levels of variables on the right-hand side and the firm-specific effects in equation (3.25), there is no interaction between the differences of these variables and the firm-specific effect. The assumption is based on the stationary hypothesis:

$$\boldsymbol{E[D_{i(t+g)} \cdot u_i] = E[D_{i(t+h)} \cdot u_i]}, \text{ for } \forall \text{g and } \forall \text{h} \quad \textbf{(3.29)}$$

$$\boldsymbol{E[X_{i(t+g)} \cdot u_i] = E[X_{i(t+h)} \cdot u_i]}, \text{ for } \forall \text{g and } \forall \text{h} \quad \textbf{(3.30)}$$

The additional moment conditions are:

$$\boldsymbol{E\{[D_{i(t-1)} - D_{i(t-2)}] \cdot (u_i + e_{it})]\} = 0} \quad \textbf{(3.31)}$$

$$\boldsymbol{E\{[X_{i(t-1)} - X_{i(t-2)}] \cdot (u_i + e_{it})]\} = 0} \quad \textbf{(3.32)}$$

The System GMM estimator is based on the moment conditions (equations (3.27), (3.28), (3.31), and (3.32)). Following Arellano and Bond (1991) and Arellano and Bover (1995), the System GMM will generate consistent estimates of parameters of interest and their asymptotic variance covariance. These can be expressed as follows:

$$\boldsymbol{\hat{\theta} = \frac{\bar{X}' Z \hat{\Omega}^{-1} Z' \bar{D}}{\bar{X}' Z \hat{\Omega}^{-1} Z' \bar{X}}} \quad \textbf{(3.33)}$$

$$\boldsymbol{AVAR}(\widehat{\boldsymbol{\theta}}) = \frac{\mathbf{1}}{\overline{\boldsymbol{X}}\boldsymbol{\prime}\boldsymbol{Z}\widehat{\boldsymbol{\Omega}}^{-\mathbf{1}}\boldsymbol{Z}\boldsymbol{\prime}\overline{\boldsymbol{X}}} \qquad \textbf{(3.34)}$$

Where θ is the vector of parameters of interest a, b, and c in equation (3.25); $\overline{D}$ is the dividend payout stacked first in differences and then in levels, $\overline{X}$ is the explanatory variable matrix that includes the first lag dividend payout $D_{i(t-1)}$ and X_{it}, Z is the instruments matrix, and $\widehat{\Omega}$ is a consistent estimate of the variance covariance matrix of the moment conditions.

In terms of the estimation of dynamic GMM, Roodman (2009) explains the selection between one-step GMM and two-step GMM: The one-step estimator assumes that error terms e_{it} are independent and homoscedastic cross sectional over time. In the second step, the assumption is relaxed via a weighting matrix that is used to produce first-step results. Then, it performs a consistent estimate of the variance covariance matrix to re-estimate the parameters of interest. Both the one-step and two-step GMM estimators are consistent, but the two-step estimator is more asymptotically efficient (Arellano and Bond, 1991). Besides, the standard covariance matrix is robust to firm-specific serial correlation and heteroscedasticity in the two-step estimator. However, the standard errors are severely downwardly biased in the two-step estimator, particularly in a small number of cross-section samples (Baltagi, 2008). Windmeijer (2005) has rectified this error by formulating a small sample correction for the two-step standard errors. Thus, after adopting Windmeijer's Correction, the reported two-step standard errors are more accurate (with a lower bias) compared to the one-step estimator. Therefore, the current study uses the two-step estimator.

3.5.6 Tests for GMM Validity

The reliability of the GMM estimator relies upon whether the instruments used in the regression are valid or not. As Arellano and Bond (1991) and Arellano and Bover (1995) suggest, two specification tests are required when using GMM in order to check the validation of the instruments. The first test is the Sargan-Hansen test of over-identifying restrictions, which examines the validity of the instruments. The instrument variables are valid in the regression when the null hypothesis is not rejected. The second check is the test for autocorrelation (AR1 and AR2) which examines whether there is serial correlation within the error term e_{it}. The null hypothesis assumes no autocorrelation. The first order serial correlation test (AR1) usually rejects the null hypothesis. This is expected since $\Delta e_{it} = e_{it} - e_{i(t-1)}$ and $\Delta e_{i(t-1)} = e_{i(t-1)} - e_{i(t-2)}$ both include $e_{i(t-1)}$. The second-order serial correlation test (AR2) in first differences is more important. It checks for auto correlation in levels and is more efficient than the AR1 test.[34]

3.6 Summary

This chapter has presented this study's research methodology. First, we explained the data collection methods. The study's results are based on an overall sample of 1,575 firms listed on the LSE, from 1991 to 2015. Data were drawn from the *Bloomberg* Database and the World Bank. Since there are missing variables in the *Bloomberg* Database, we used an unbalanced panel with 20,858 firm-year observations. Second, the variables specification are shown in Section 3.3. We have explained our rationale for calculating ratios (variables). To mitigate both potential multicollinearity issues and outlier effects and further improve our model's efficiency, we adjusted, scaled down or winsorised some ratios. Following Lintner's (1956) classic dividend model, in Section 3.4 we constructed several empirical models (equations (3.17) to (3.20)) to investigate the dividend payout via working capital under both cash dividend and stock dividend scenarios. Since a stock dividend differs from a cash dividend, a few changes were made to the stock dividend models (equations (3.19) and (3.20)) compared to the cash dividend models. Lastly, Section 3.5 has provided a critical discussion on the selection of estimation techniques. We have reported some basic diagnostic test results before we estimate the classic linear model (general OLS). Next, combining the dividend literature and the empirical findings, we concluded that the dividend payout has a dynamic relationship, which suggests that dynamic OLS and FE are more favourable compared to "static" models. Further, we have highlighted the limitations of the dynamic FE estimator. To address serial correlation and potential endogeneity issues, to mitigate estimation bias and improve our dividend model efficiency, we used a dynamic System-GMM estimator (based on two-step). The last section has outlined GMM estimator validity tests.

[34] For the Sargan-Hansen tests and the second-order autocorrelation test (denoted as m_2 in our output), see the GMM regression result in Chapter 4.

Table 3.7 Definition of Variables for Equations (3.17), (3.18), (3.19) and (3.20)

Abb	Variables	Measurements
CD_{it}	Cash Dividend Payout Ratio	The cash amount distributed for common dividend divided by total assets
SD_{it}	Stock Dividend Payout Ratio	The stock value declared for dividend divided by total payout ratio
$\Delta WC_{it}, \Delta WC^2{}_{it}$	Change in Working Capital (squared)	Change in working capital (squared)
$Div - adj\ Earning_{it}$	Dividend-adjusted Earnings	Profits after tax and interest excluding any dividend declared, and adjustments divided by total assets
ΔTP_{it}	Change in Trade Payables	Change in trade payables, along with other short-term payables(within 12 months), excluding tax payables
ΔTR_{it}	Change in Trade Receivables	Change in trade receivables, along with other short-term receivables (within 12 months)
Tax_{it}	Taxation	Tax paid via cash divided by total current liabilities
Inv_{it}	Investment Policy	(Short-term investments + long-term investments)/ total assets
$Rep_{i(t-1)}$	Stock Repurchase	The value of repurchase stock at i(t-1) period, divided by total assets
EPS_{it}	Basic Earnings per Share	(Profit or loss attributable to common equity holders of parent company) divided by (weighted average number of common shares outstanding during the analysed period)
$Size_{it}$	Firm Size	Log value of sales
$Gearing_{it}$	Gearing Ratio	Long-term debt/total common equity
ROE_{it}	Return on Equity	Net income available to common shareholders divided by average total common equity
MtB_{it}	Market-to-Book Ratio	Market Capitalisation/Book Value of Equity
$Dum(fs)$	Dummy Variable of Financial Shock	1 for financial shock period, 0 for non-financial shock period
$GDPg_{it}$	GDP Growth	The UK's annual GDP growth
Inf_{it}	Inflation Rate	The UK's annual inflation rate
e_{it}	Error Term	Estimated error term

Source: Author's calculations

Chapter 4 Results and Discussion

4.1 Introduction

This chapter presents the empirical results. Section 4.2 provides descriptive statistics of the dividend payout [35] and explanatory variables. Section 4.3 presents the results of the cash dividend models, based on the two-step system GMM estimator and the stock dividend model with the Fixed-effect estimator. Specifically, Section 4.3.1 presents the empirical findings on cash dividend payouts from the overall sample. Sections 4.3.2 and 4.3.3 present the empirical findings on cash dividend payouts from the subsamples. The empirical findings on the stock dividends are discussed in Section 4.3.4. Section 4.4 reports the robustness test results of the estimated dividend models. Section 4.5 summarises the chapter.

4.2 Descriptive Analysis

Table 4.1 reports the cash dividend payouts (both in numbers and in ratios) of firms listed on the LSE, from 1991 to 2015. The table shows that the dividend ratios (as a percentage of sales revenues) fluctuate between 2% and 5%. This indicates that the dividends to revenues ratio does not change significantly from 1991 to 2015. On the contrary, the average cash dividend payout increased dramatically from £34.83 billion to £127.12 billion (over 3.6 times), from 1991 to 2015. Similarly, the total cash dividend payout went up, astoundingly from £7,071 billion to £166,652 billion over the study period. Interestingly, these increases are nonstop, despite sharp decreases in 2008 and 2012.

We also found that 11 firms did not pay cash dividends in 1991. This number peaked at 732, which is more than the number of firms who issued dividends in 2013. In 2014 and 2015, the number of firms which did not pay dividends accounted for nearly half of the firms listed on the London Stock Exchange. These results are consistent with Fama and French's (2001) finding that the propensity of firms to pay any dividend has decreased over the last two decades. Significantly, the total dividend payout amount issued by firms has increased over the same period (Denis and Osobov, 2008).

The total cash dividend payout in 2008 decreased to around £9,908 billion compared to 2007,

[35] In this chapter, the cash dividend payout has several meanings. The cash dividend payout refers to the total common cash dividend payout in Table 4.1. In section 4.3, it represents a ratio of the cash dividend payout as a percentage of total assets.

where the firms' average cash dividend payout shrank by about 17.86%. Furthermore, the average cash dividend payout dropped by approximately 23% in 2012, with the total cash dividend payout decreasing from £158,146 billion to £126,366 billion. The substantial decrease in the total cash dividend payout in 2012 is more than three times greater than the last drop in 2008. Sudden drops in cash dividend payouts were most likely caused by UK macroeconomic fundamentals, such as the global financial crisis in 2008 and the double-dip recession in 2012.[36] It appears that the cash dividend payout is affected by both global and domestic financial shocks. However, the decline in the total amount of dividends paid out in 2012 was higher than in 2008. In this case, it is likely that the UK domestic economic condition had a more significant impact on the firm's dividend payout compared to the 2008 global financial crisis. These results imply a high level of independence and sovereignty in the UK economic condition. The number of observations (both dividend-paying firms and non-paying firms) increased from 203 to 1,311, from 1991 to 2015. As a matter of fact, the total IPOs (Initial Public Offers) on the UK official list are only 15 in 1991 (Khurshed et al., 1999). However, by 2015, there are over 2,300 firms listed on the London Stock Exchange.[37] Reductions in the propensity of dividends issued can be explained by the dramatic increase in newly listed firms (Denis and Osobov, 2008).

According to the Life-Cycle Theory (Mueller, 1972), young firms have more investment opportunities and thus are less likely to issue dividends, while mature firms with more stable cash flows are more likely to pay dividends. The result also shows that a small group of dividend-paying firms issued substantial dividends (in value), which contributed to dramatic increase in the total cash dividend payout. It has been reported that in 2005 33% of all UK dividends were paid by five firms (British Petroleum, Shell, HSBC, GlaxoSmithKline and Vodafone).[38] As argued, mature firms with more stable cash flows are more likely to issue dividends and to adopt a stable dividend approach (growth/fixed dividend). For example, Vodafone's dividend per share was 1.272p in 1999. It increased at a certain growth rate between 2% to 15% over several years, to 11.45p in 2016.[39]

In summary, the cash dividend payout shows an increasing trend over the sample period, despite decreases in 2008 and 2012. Fewer firms issued dividends, but those dividend-paying firms issued more dividends over the study period. In other words, dividends were paid by a small group of firms. The results are consistent with other studies in the US (see Fama and French, 2001; DeAngelo et al., 2004; Denis and Osobov 2008).

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[36] Because of the sharp drop in dividend payouts in 2008 and 2012, we used the years 2008 and 2012 as a dummy variable (equals to 1) to measure external financial shocks in the empirical analysis.

[37] By 31 Dec 2015, there were 2,365 firms listed on LSE, of which 1,257, 1,044 and 64 are listed on the Main Market, the AIM market and the SFM/PSM, respectively. For more info: www.londonstockexchange.com

[38] Source: www.newtonim.co.uk/uk-institutional/blog/chris-smith/uk-dividends-uncovered/

[39] See www.vodafone.com

Table 4.1 Cash Dividends Payouts

	Cash Dividend Payouts (£ Billion)			Dividends/Revenues			No. of Non-payers	No. of Payers
Year	Mean	S.D.	Sum.	Mean	S.D.	Observations		
1991	34.836	136.225	7,071.620	0.037	0.049	203	11	192
1992	30.911	113.165	7,078.620	0.036	0.045	229	23	206
1993	30.597	107.184	7,557.570	0.036	0.045	247	23	224
1994	30.814	113.333	10,076.300	0.040	0.053	327	33	294
1995	40.362	174.464	15,256.800	0.040	0.058	378	53	325
1996	41.028	217.823	17,806.200	0.040	0.056	434	72	362
1997	44.865	220.823	21,490.100	0.039	0.057	479	95	384
1998	45.399	241.938	23,199.000	0.041	0.062	511	111	400
1999	50.152	251.815	28,135.000	0.036	0.056	561	167	394
2000	55.325	300.925	33,360.800	0.033	0.054	603	204	399
2001	56.491	322.851	35,928.300	0.031	0.056	636	240	396
2002	65.814	378.615	42,976.500	0.030	0.053	653	250	403
2003	73.843	432.300	48,884.200	0.029	0.053	662	241	421
2004	85.757	658.350	65,518.600	0.033	0.067	764	315	449
2005	72.643	497.333	64,651.800	0.032	0.063	890	418	472
2006	77.567	550.053	77,334.200	0.034	0.067	997	473	524
2007	83.523	600.644	91,039.900	0.039	0.077	1,090	518	572
2008	70.857	552.366	81,131.300	0.030	0.067	1,145	599	546
2009	96.866	1,322.550	114,205.000	0.031	0.072	1,179	659	520
2010	112.809	1,738.890	135,145.000	0.030	0.067	1,198	627	571
2011	126.415	1,963.510	158,146.000	0.029	0.063	1,251	659	592
2012	97.731	889.647	126,366.000	0.033	0.070	1,293	674	619
2013	126.456	1,427.160	173,877.000	0.036	0.076	1,375	732	643
2014	121.862	1,763.960	174,507.000	0.041	0.081	1,432	731	701
2015	127.118	1,702.880	166,652.000	0.045	0.085	1,311	622	689

Standard deviation (S.D.) of the average total common cash dividend payouts (in Billion GBP) and dividends to revenues ratios are provided. Sum represents the accumulated cash dividend payouts of all firms. Observations indicate the number of firms for which dividend payout information is available on the LSE by year. Non-payer and payer refer to whether a firm issued any cash dividend.

Source: Author’s calculations

Table 4.2 Dividends, Earnings and Net Working Capital by Industry from 1991 to 2015 (in Billion GBP)

Sector	No. of firms	Dividends		Net Earnings		Net Working Capital		Dividends/Earnings	
		Mean	Sum	Mean	Sum	Mean	Sum	Mean	Sum
Basic Materials	177	71.22	142,162.00	129.52	271,481.10	203.55	422,566.00	54.99%	52.37%
		(453.40)		(1,173.71)		(1,072.01)			
Consumer Goods	110	81.74	142,710.00	179.42	326,009.30	170.44	310,379.00	45.56%	43.77%
		(327.161)		(930.48)		(1,518.62)			
Consumer Service	232	59.12	178,671.00	128.85	410,757.10	-255.13	-808,748.00	45.89%	43.50%
		(693.90)		(1,789.74)		(3,147.52)			
Financials	337	91.43	322,566.00	2,165.02	8,127,482.00	178.97	472,670.00	4.22%	3.97%
		(562.78)		(123,528.20)		(2,335.47)			
Health Care	109	89.72	103,084.00	146.75	182,264.90	137.62	171,057.00	61.13%	56.56%
		(488.66)		(816.29)		(716.40)			
Industrials	301	17.38	83,171.60	32.33	159,548.90	46.19	226,427.00	53.75%	52.13%
		(121.55)		(245.79)		(376.86)			
Oil and Gas	123	200.02	263,226.00	408.33	580,242.50	228.05	318,814.00	48.98%	45.36%
		(1,275.49)		(2,755.84)		(2,123.60)			
Technology	144	3.65	6,505.64	2.70	5,160.37	12.95	24,658.10	34.90%	126.07%
		(16.62)		(54.64)		(66.80)			
Telecommunication	21	1,821.32	435,295.00	1,820.85	460,675.00	-1,266.66	-324,266.00	100.03%	94.49%
		(8,744.51)		(10,935.31)		(5,298.04)			
Utilities	21	177.95	50,004.80	235.25	68,458.08	-105.03	-30,669.20	75.64%	73.04%
		(312.13)		(528.44)		(578.15)			
Total	1,575	87.03	1,700,000.00	506.63	11,000,000.00	39.73	782,889.00	17.18%	15.45%
		(1,114.59)		(52,370.50)		(1,860.44)			

Note: All firms are classified into ten sectors according to the FTSE sector on the LSE. Mean and Sum refer to the average and accumulated cash dividend, net earnings and net working capital, respectively. Standard deviations (S.D.) of the mean cash dividend/net earnings/net working capital are presented in parentheses.

Source: Author's calculations

1

Table 4.2 shows the cash dividend payouts, net earnings, working capital and dividends to earnings ratios by industries over the study period. As observed, firms in the telecommunication sector issued the largest cash dividends (a cumulative number of £432,295 billion), followed by Financial, Oil and Gas, Consumer Service, Consumer Goods, Basic Material, Health Care, Industrials, Utilities and Technology. The result shows that firms in the largest dividend payout sectors also make the highest net earnings.

Telecommunications and Oil & Gas firms rank second and third places regarding net earnings and accumulated earnings. We conclude that firms with higher net earnings are more likely to issue dividends (see also Fama and French, 2001). Over the past 25 years, the average Telecommunications dividend payout (£1,821 billion) is nearly 20 times higher than the financial sector (£91.43 billion). Although the total dividend payout in the financial sector is higher than in the Oil and Gas sector, the average dividend payout of the Oil and Gas sector is twice as high as the financial sector. A major reason could be the difference in business landscape between the Telecommunications and Financial sectors. Telecommunication firms are very profitable and have many pre-paid business transactions. Therefore, most of the firms adopt a growth dividend approach (for example, Vodafone). Oil and Gas also make huge profits. The UK is the 14th largest oil and gas producer in the world (and the second largest in Europe).[40] Similarly, firms in the Utility sector (some owned by the UK government) have higher average net earnings and thus a more stable cash flow. The average dividend payouts range from £60 to £90 billion, similar to the Basic Materials, Consumer Goods, Consumer Services, and Health Care sectors. Firms in the Technology sector with the lowest net earnings (mean of £2.7 billion) issued the smallest cash dividend payout (mean of £3.64 billion). Firms in the Industrial sector issued the second lowest average cash dividend of £17.38 billion. Firms in the Utility sector had an average dividend payout of £177.95 billion, which was slightly lower than Oil and Gas' dividend payout. The financial sector reported 76.7% (8.127/10.600) net earnings, but only 18.97% of the total dividend payouts. It is likely that firms in the financial sector have different considerations regarding payout policies. During the 2008 global financial crisis period, some financial institutions (including most of the banks) were prohibited (by the financial regulators) from issuing dividend payouts or increasing dividend payouts (Ashraf et al., 2015; Cohen and Scatigna, 2016). Another reason is that some bank dividend payouts are limited due to the capital adequacy requirements, such as the Basel Accords (Ashraf et al., 2016; Hirtle et al., 2016; Rogers, 2018). One inference is that capital structure plays a critical role in dividend payouts for firms in different sectors (financial versus non-financial firms).

[40] See BP Statistical Review of World Energy 2009, available on www.bp.com

Table 4.2 also shows that Telecommunications, Oil and Gas and Financial firms contributed most of the total cash dividend payout (over 60%) in the UK stock market. Not surprisingly, these sectors are also the most profitable. Thus, firms with higher earnings tend to issue more dividend payouts; firms with lower earnings issued the smallest dividends.[41] These findings are consistent with previous studies (Fama and French, 2001; Murekefu and Ouma, 2012). The average dividend payout (£87.03 billion) is smaller than the average net earnings (£506.63 billion). However, we found that the average dividend payout is higher than the average net earnings in the Technology and Telecommunications sectors. This shows that these sectors paid more in dividends than they earned, which requires extra funds. It also implies that firms in these two sectors adopt a more aggressive dividend payout policy (see also the dividends/earnings ratio in Table 4.2). The result also indicates that firms in the Oil and Gas, Basic Materials, and Financial Sectors exhibit higher levels of net working capital compared to the other sectors. The telecommunication firms, the largest dividend payout sector, with considerable earnings, report the lowest net working capital. Interestingly, firms in the financial sector have a dividend payout ratio of only 3.97% of their earnings (the smallest payout ratio among all sectors). This is a stark contrast to the dividend payout ratio of other sectors (excluding financial firms), which is around 55.71% of earnings. This implies that dividend payouts differ markedly between financial and non-financial firms.[42]

Table 4.3 UK Stock Dividend Payouts (Over Total Payouts)

Year	Mean	Median	S.D.	Sum.	N
2012	0.682	0.682	0.180	6.817	10
2013	0.583	0.523	0.289	19.820	34
2014	0.703	0.839	0.305	35.872	51
2015	0.726	0.832	0.276	37.026	68
Total	0.677	0.777	0.291	99.557	163

Stock dividend (rate) is calculated as the total payout minus total common cash dividend, minus stock repurchase and divided by the total payout.
Source: Author's calculations

Table 4.3 illustrates the stock dividend payout results over the study period. The dominant shareholders of UK firms would not opt for a stock dividend; cash dividends are the preferred option (Lasfer, 1997a). Based on our calculation of stock dividend rates, the sample of the stock dividend is small compared to the cash dividend sample.

[41] The dividend payouts are related to earnings both for firms and investors. The use of working capital variable (as a proxy for cash) is less obvious for unsophisticated investors, but more useful for managers and academic scholars.
[42] A mean test shows that the ratio of dividends to earnings for financial and non-financial firms are significantly different at the 1% level.

Table 4.4 Stock Repurchases (in Billion GBP)

Year	Mean	S.D.	Sum.	Observations	No. of Non-repurchasers	No. of Repurchasers
1991	0.671	8.336	132.902	198	191	7
1992	0.579	7.288	132.524	229	222	7
1993	0.490	3.551	120.598	246	238	8
1994	2.893	28.503	931.459	322	307	15
1995	1.001	11.599	369.394	369	346	23
1996	3.748	45.132	1,585.500	423	393	30
1997	11.645	145.712	5,461.430	469	438	31
1998	6.994	68.286	3,531.890	505	448	57
1999	2.413	23.731	1,334.320	553	482	71
2000	12.296	109.268	7,328.580	596	506	90
2001	19.213	157.305	12,180.900	634	548	86
2002	16.090	124.065	10,249.400	637	527	110
2003	14.915	120.504	9,903.260	664	515	148
2004	36.330	369.566	26,302.700	724	541	183
2005	50.409	554.944	42,948.100	852	659	193
2006	67.456	677.097	66,174.500	981	750	231
2007	50.415	396.035	54,700.400	1,085	811	274
2008	20.487	187.358	23,682.700	1,156	870	286
2009	7.118	147.503	8,527.820	1,198	958	240
2010	19.484	322.798	24,433.300	1,254	986	268
2011	33.805	503.175	45,365.900	1,342	1,031	311
2012	16.426	143.596	22,799.600	1,388	1,044	344
2013	18.129	209.921	26,250.100	1,448	1,061	387
2014	14.559	160.951	21,475.000	1,475	1,094	381
2015	11.410	85.331	15,415.200	1,351	1,055	296

SD is the standard deviation of average stock repurchase (in Billion GBP), and Sum represents the accumulated stock repurchase of all firms. Observations indicate the number of firms for which stock repurchase information is available on the LSE by year. Non-repurchaser and repurchaser refer to whether a firm repurchase its own stock.
Source: Author’s calculations

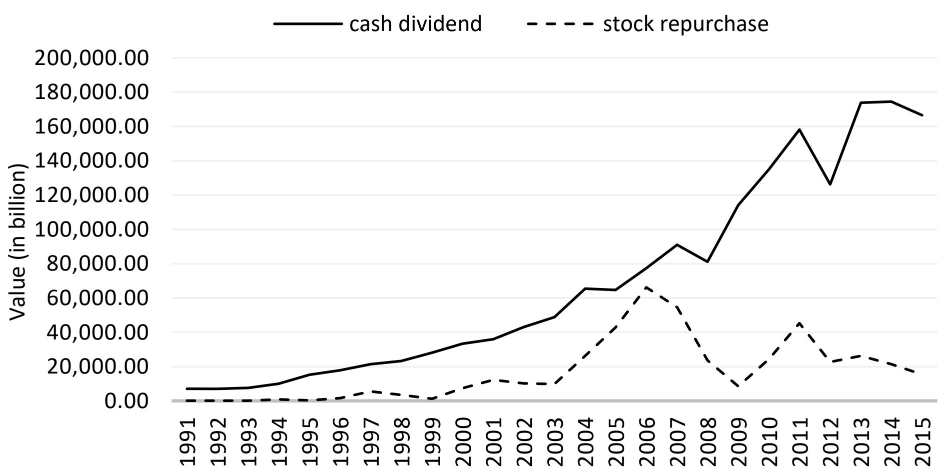
Thus we have 163 observations for the stock dividend. Interestingly, stock dividend data, which is available from 2012, exhibits an increasing trend.[43] The number of firms that issued stock dividends is small, but the average stock dividend rate is relatively high (67.75%). This indicates that when firms issued stock dividends, they were less likely to issue cash dividends or stock repurchases, or they only issued a small proportion of cash dividends or stock repurchases at the same time. Lasfer (1997b) found that firms that issued script dividends do not follow an optional dividend policy and the script dividend is likely to be low, because it is unlikely that the majority shareholders will opt for it.[44] The author also argues that firms' which offer a script dividend generally do so because of shareholder pressure. Lasfer reveals that firms' pay script dividends because non-institution investors request it. In short, if firms do not pay a scrip dividend, it is because the shareholders have not requested this option. It is most likely that shareholders have not requested a stock dividend and because the cash dividend is more popular among the UK.

Table 4.4 reports the descriptive statistics for stock repurchases, from 1991 to 2015. The table shows stock repurchases, another form of corporate payout, present a more volatile situation, compared to cash dividends. This finding is similar to Dhanani and Roberts' (2009) results. In the UK, stock repurchase has been legalised since 1981 and became popular after tax reforms in the earlier years (Andriosopoulos and Hoque, 2013). According to Table 4.4, stock repurchases increased on a few occasions after the 1990s. The table shows a marked increase in the number of firms engaged in stock repurchases after 2000. In 1991, only seven firms repurchased their own stocks. However, this figure rose to 387 at the end of 2013. The first increase began during the period of 1991 to 1997. This practice decreased significantly until 1999 (average £2.41 billion). In contrast to the US, stock repurchasing in the UK has timing, price and volume restrictions and needs shareholders' approval. Firms must also disclose financial information before engaging in stock repurchases (Dhanani and Roberts, 2009). In the UK, regulators are concerned about stock repurchase because it involves insider trading (Ikenberry and Vermaelen, 1996). Hence, the slow development of stock repurchase (both in value and the number of firms that repurchased their stocks) in the early 1990s may be a result of the UK regulations and the company act which outlines several constraints on stock repurchase programmes. The second increase began in 2000 and reached its peak in 2006 (£66,174.5 billion). Stock repurchases show a downward trend over the period of 2006 to 2015. In the year 2009, the average stock repurchase decreased nearly 86%, while the total stock repurchase rate decreased around 84% compared to 2007. Further in 2012, the average stock repurchase dropped to around 51%,

[43] We obtained stock dividend information starting from the year 2012 in *Bloomberg*.
[44] Scrip dividends, also known as stock dividends, involve firms offering shareholders a new issue of shares instead of cash dividends.

while the total stock repurchase decreased by about 50%. UK market condition changed markedly as a result of the 2008 financial crisis. A large number of firms had financial difficulties and ended up bankrupt during the crisis period. Firm payouts decreased dramatically, and as a result, the growth in stock repurchase rapidly reversed.[45] Despite a major decline in stock repurchases in the UK during the 2008 financial crisis period, it has become a popular payout method in the last decade. The literature has revealed several determinants of stock repurchase in the UK context, which provide some explanations for stock repurchase patterns in Table 4.4. Rau and Vermaelen (2002) found that firms' stock repurchase announcements are driven by taxes on capital gains that are lower than taxes on dividends. Hjelmstad et al. (2006) argue that agency theory of free cash flow helps to explain stock repurchases. von Eije and Megginson (2008) conclude that the average reporting frequency of EU firms (including the UK) is correlated with higher cash dividends and stock repurchases. Andriosopoulos and Lasfer (2015) found that a change in legislation in the UK which allows firms to treat stock repurchase as treasury stocks is a major factor in explaining stock repurchases. In a more comprehensive qualitative study on UK stock repurchases, Dhanani and Roberts (2009), argue that the practice can be explained by several motivations, including as a substitution for dividends, for signalling purposes, minimising agency problems, and protecting the firm against potential takeovers. Similar to dividend payouts, we found that stock repurchasers also converge to a small number of firms based on the number of firms that repurchase their stocks, as well as repurchase amounts. In contrast to dividend payouts, stock repurchases are much smaller (both in number and magnitude).

Figure 4.1 Dividends versus Stock Repurchases



Total cash dividends and stock repurchases (in £ amount) for all firms on the LSE, from 1991 to 2015.
Source: Author's calculations

Figure 4.1 compares the two different payout forms (dividends versus stock repurchase). Both

[45] UK FTSE 100 firms reported a decrease of 43% in stock repurchases compared to the previous year (2008 to 2009).

dividends and stock repurchases increased from 1991 to 2006. Stock repurchases exhibited a downward trend, from 2006 to 2009. After a significant decrease during 2007-2009, they increased again until 2011. A second decrease happened during 2012 to 2015. As Figure 4.1 shows, firm payouts (dividends and stock repurchases) dropped significantly during the two financial crises periods (the 2008 global financial crisis and the 2012 economic recession). Figure 4.1 also shows that these financial crises had a longer impact (negative) on stock repurchase than on cash dividends. After 2009, cash dividends and stock repurchases reveal similar trends (decrease in popularity), but the volume of cash dividends is much larger than stock repurchases. To sum up, stock repurchase behaviour has increased significantly over the last two decades, but dividends (especially cash dividends) is still the dominant payout form among UK firms. We find major changes for both dividends and stock repurchases, but the changes are not the same. At this stage, we did not observe any evidence that stock repurchases are substitutes for dividends (Grullon and Michaely, 2002).

Figure 4.2 presents the firms' average working capital, trade receivables and trade payables, from 1991 to 2015, for the overall sample, divided into two sectors; the financial sector and non-financial sector. Both levels of trade receivables and trade payables are positive over the study period in Figures 4.2 (a), (b) and (c). In Figure 4.2 (a), the trade receivables and the trade payables increased from 1991 to 2006, and decreased in 2007. After 2009, both trade receivables and trade payables show a growth trend until 2012. In particular, the trade payables start to increase dramatically from 2014 to 2015. These increase significantly from 2013 to 2015 in Figure 4.2 (b). Although increasing trade payables/short-term debts is not necessarily treated as a weakness, it could be seen as a potential issue (credit risk) for financial firms. According to pecking order theory (Fama and French, 2002), debt finance is preferred over equity finance when internal financing cannot meet a firm's need. However, too much reliance on trade payables (short-term debts) is not favourable and may lead to firm deteriorate (that is, increased credit risk or bankruptcy risk and etc.). Interestingly, in Figure 4.2 (c) the trade receivables for non-financial firms are relatively flat (they show a slight increase). Working capital (including trade receivables and trade payables) varies because of different business cycles, but the changes in trade receivables and trade payables move in a similar direction. This is analogous to Wilson's (2014) findings. The only difference is that the average trade payable is lower than the average trade receivable during the study period. In particular, the average trade receivable is much higher than the trade payable in 2006 and from 2012 to 2015. It appears that UK firms relied on trade payables to fund growth after 2009 (Wilson, 2014). However, this is not the case if financial firms are treated separately. In Figure 4.2 (b), the trade receivables are much higher than the trade payables for the study period. Figure 4.2 (b) also shows that trade receivables have more volatile movement compared to the trade payables which have a lower mean (around £50 billion) and smaller standard deviations. Financial firms' working capital does not have negative value during the study period. Figure 4.2 (a) reveals that trade receivables and trade payables have positive values and that UK firms have more trade payables and more transactions traded on credit over the study's period. In terms of non-financial firms, working capital, trade receivables, and trade payables' movement are similar to the overall sample descriptive statistics (see Figure 4.2 (c)). This implies that most UK firms (excluding financial firms) rely on trade credit more than on short-term borrowing and have more "cash to be received/collected," which puts pressure on both payables and receivables management.

Figure 4.2 (a) also shows that firms' average working capital started at around 100 billion GBP in 1991 and decreased over time, until it reached its minimum value of -20 billion GBP in 2002. There was a sharp drop (nearly £50 billion), in working capital in 1998 as shown in Figures 4.2 (a) and (c). This may have resulted from negative growth in the British economy in 1998. Negative working capital (current liabilities exceed current assets) is often treated as a bad sign. It occurs when a firm makes a profit so fast (also known as deferred revenue) that it provides products/services to the client before receiving cash (for example, some hi-tech firms)[46]. One can conclude that decreases in working capital show that UK firms (excluding financial firms) were more aggressive in managing their working capital from 1991 to 2002. After 2003, working capital recovers from negative values to zero and starts to increase over the subsequent years. For non-financials, increased working capital is often seen as an indication of profitable investments/expansions, which require the use of cash. Within the recovery period, average working capital dropped to nearly zero in 2008 and decreased to £50 billion in 2012. These decreases were most likely caused by the global financial crisis in 2008 and the UK's double-dip recession in 2012.[47] Working capital was relatively stable after 2013, with an average of £60 – 70 billion. Overall, working capital decreased significantly from 1991 to 2002. It increased after 2002 except for two drops during recession periods in 2008 and 2012. However, working capital does not change considerably for financial firms, as shown in Figure 4.2 (b). Consistent with observations in Table 4.2, one can infer that financial firms' working capital (includes trade receivables and trade payables) are different from non-financial firms' working capital. Besides, we also observe that the performance (working capital variables) of firms listed on the LSE does not change dramatically after the exclusion of financial firms. The only difference is that trade payables show a relatively smaller slope in Figure 4.2 (c) from 2013 to 2015 (compared to the sharp increase in Figure 4.2 (a)). One can conclude that the majority of the firms listed on the LSE have an aggressive way of managing their working capital

[46] In 2011, GEOEYE had an operating working capital of -50.24%, and GLOBAL DIGITAL had an operating working capital of 92.98% (for detail see: www.cashflowanalytics.com)

[47] Credit policies tightens up during economic downturns and so trade payables are expected to decrease during a recession, particularly if the firm is in an industry that is hit hard by declining sales or if the firm itself is experiencing hard times.

Figure 4.2 (a) Average Working Capital, Trade Receivables and Trade Payables (in Billion GBP)

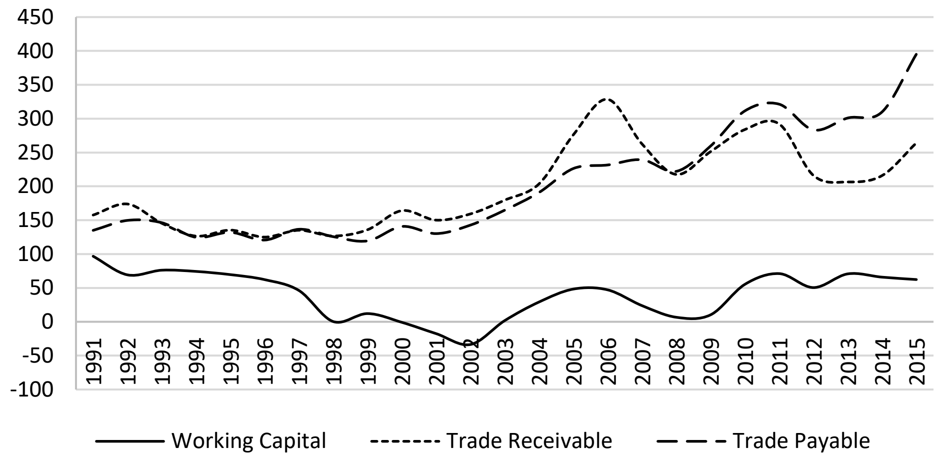


Figure 4.2 (b) Financial Firms' Average Working Capital, Trade Receivables and Trade Payables (in Billion GBP)

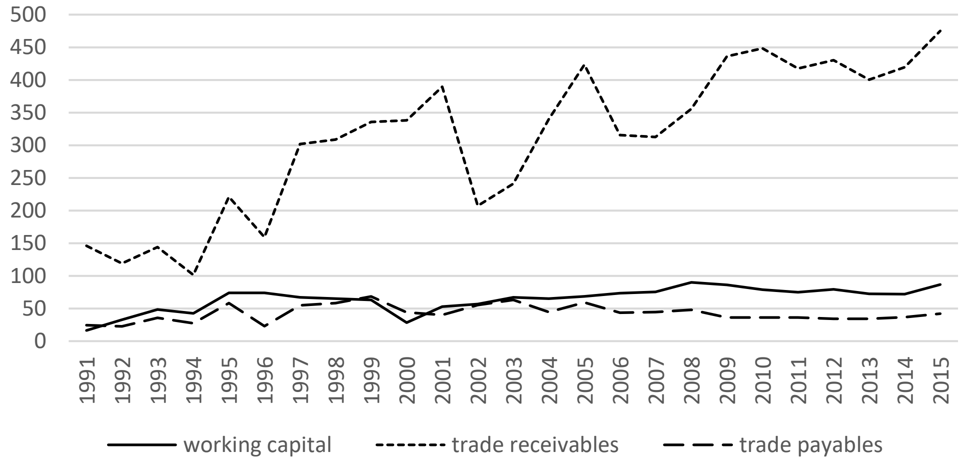
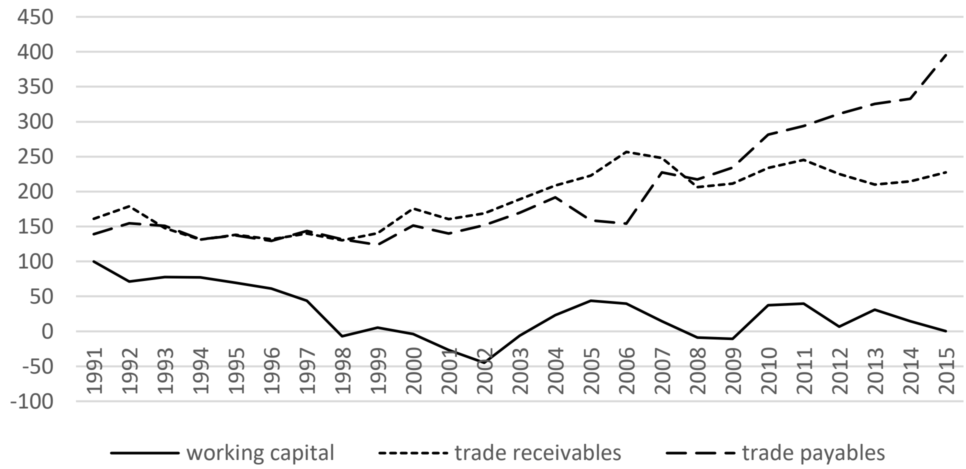


Figure 4.2 (c) Non-Financial firms' Average Working Capital, Trade Receivables and Trade Payables (in Billion GBP)

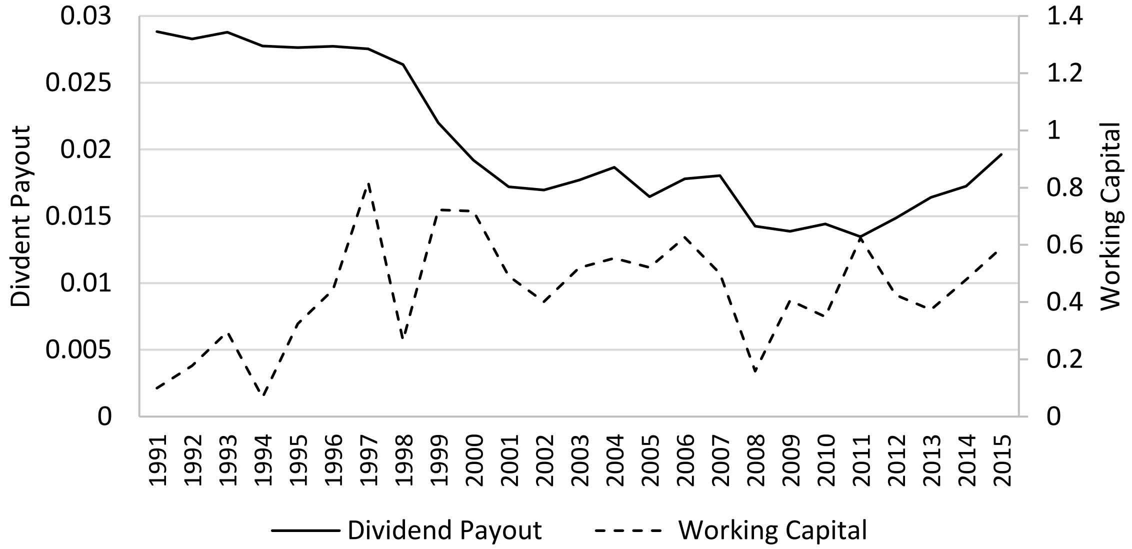


Note: This table includes the average working capital, trade receivables and trade payables (in £ amounts) of all the firms on the LSE from 1991 to 2015. Most firms in the financial and service sectors do not hold any physical inventories or other working capital components. Therefore, firms' inventories and trade receivables/payables are not obvious in these sectors.
Source: Author's calculations

from 1991 to 2002, but change to a relatively more conservative policy from 2008 to 2012. Working capital was also affected by the external financial shocks (the financial crises).

To assess whether there is a relationship between dividends and working capital, we examined dividend payout trends and changes to working capital in Figure 4.3.

Figure 4.3 Dividend Payouts (as a Percentage of Total Assets) versus Changes in Working Capital from 1991 to 2015



Note: Dividend payout (the left vertical axis) is indicated as a ratio calculated as the total common cash dividend divided by the total assets. Changes in working capital (the right vertical axis) are shown in percentage form.
Source: Author’s calculations

The dividend payout ratio displays a slowly descending trend from 1991 to 1998. It decreases significantly from 1998 to 2001. In contrast, working capital tends to increase. Despite decreases in 1994 (the minimum) and 1998, working capital increases from 1990 to 1999. The up and down movements of dividend payouts and change to working capital are similar from 2000 to 2008. The dividend payout continues to decline until 2011, while working capital starts to increase from 2008 to 2011. Again, both working capital and dividend payout shift to an increasing trend after 2012. As Figure 4.3 reveals, the dividend payout and the change in the working capital have similar movements for some periods but not for the entire study period. Sometimes, they move in opposite directions. This result coincides with our expectation that the relationship between working capital and dividend payout is nonlinear.

Table 4.5 and Figure 4.4 jointly report the UK’s GDP growth rate and inflation rate from 1991 to 2015. Table 4.5 reports the descriptive statistics for GDP growth and inflation rate variables. As observed, the inflation rates are positive for the entire study period, while the GDP growth rate fluctuates more (positive and negative values), and has a higher standard deviation compared to the inflation rate. Figure 4.4 shows that the GDP growth and inflation rate move in opposite directions.

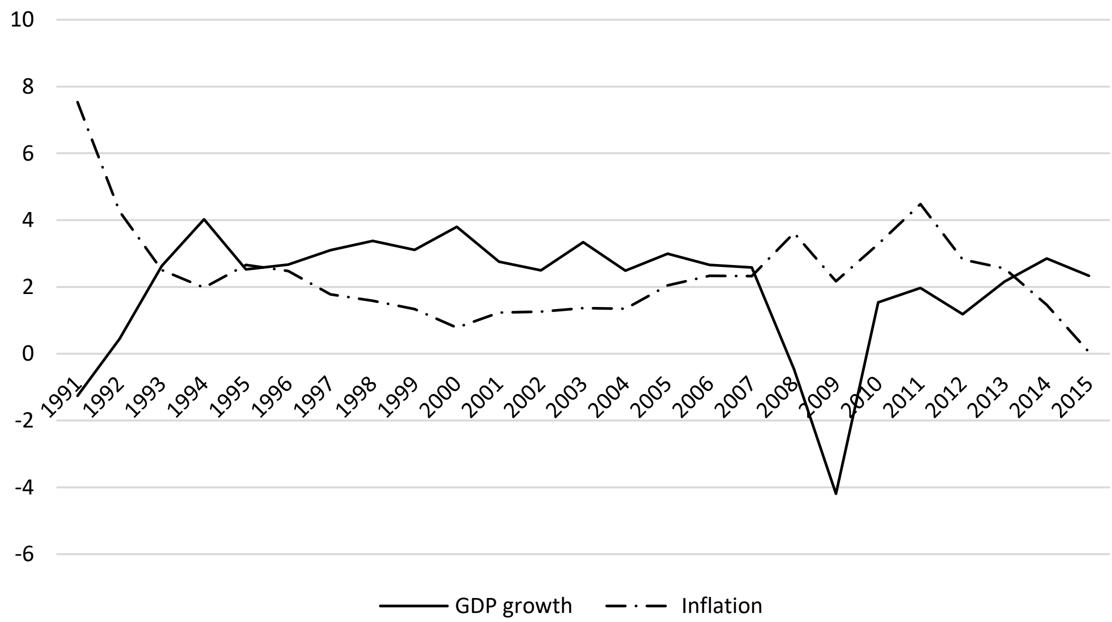
When the GDP growth rate goes up, the inflation rate decreases from 1991 to 1994. The GDP growth rate and inflation are maintained between 2 and 3% until 2007. In 2008, the inflation rate goes up by 3.6% while the GDP growth rate decreases to a negative value (and keeps decreasing to a minimum of -4.19% in 2009). From 2009 to 2011, the GDP growth rate and inflation rate share a similar trend. After 2012, these rates move in opposite directions. The GDP growth and inflation rates decrease in 2015.

Table 4.5 UK's GDP and Inflation

Variable	Obs.	Mean	S.D.	Min.	Max.
GDP growth (%)	25	1.872	1.816	-4.192	4.024
Inflation (%)	25	2.256	1.205	0.050	7.533

Source: Author's calculations

Figure 4.4 UK's GDP and Inflation



Note: GDP growth and inflation are shown in percentage form
Source: Author's calculations

Table 4.6 provides summary statistics (average and number of observations) of the dependent and the explanatory variables,[48] from 1991 to 2015. As documented in Table 4.6, the standard deviation of most variables shows a small magnitude except for total assets.[49]

[48] Most of the firm specific variables are scaled by Total Assets and winsorised at the 1% level except for Size and Total Assets.
[49] The Total Assets variable differs and has extreme values for some firms. It is used as a denominator to scale down a majority of the variables and we do not winsorise the TA variable at any level.

As firms listed on the LSE vary from sector to sector, the total assets of firms differ significantly. For example, firms such as Tracsis PLC (software-based) have a significant amount of assets (over £30 million in 2015 and reaching £48 million in 2016), while Beowulf Mining PLC owns a small number of assets (only a few million pounds worth).

Table 4.6 Summary Statistics of the Dependent and Explanatory Variables (1991 to 2015)

Variables	N	Mean	Min.	P25	Median	P75	Max.
CD	20,858	0.018 (0.028)	0.000	0.000	0.006	0.026	0.164
ΔWC	17,966	0.467 (3.304)	-8.711	-0.295	0.058	0.470	22.700
ΔTP	16,433	0.395 (1.564)	-0.902	-0.148	0.061	0.347	11.543
ΔTR	15,270	0.402 (1.741)	-0.918	-0.111	0.063	0.310	13.700
Div-adj Earnings	20,858	-0.107 (0.439)	-3.057	-0.069	0.011	0.048	0.309
Tax	19,718	0.041 (0.112)	-0.423	0.000	0.007	0.066	0.544
Inv	20,858	0.028 (0.104)	0.000	0.000	0.000	0.0002	0.698
Gearing (%)	19,391	42.574 (94.349)	0.000	0.000	7.810	44.084	669.601
ROE (%)	18,010	0.218 (42.633)	-196.812	-7.381	8.081	19.193	109.706
MtB (%)	18,295	2.763 (4.659)	-11.214	0.870	1.657	3.174	30.094
EPS	19,321	0.030 (1.586)	-11.291	-0.015	0.043	0.200	6.500
Size	18,836	4.060 (2.947)	1.210	2.313	4.111	6.023	13.603
Rep	20,858	0.004 (0.017)	0.000	0.000	0.000	0.000	0.121
GDPg (%)	25	2.045 (1.786)	-4.192	1.972	2.586	2.996	4.024
Inf (%)	25	2.370 (1.487)	0.050	1.363	2.166	2.656	7.533
Total Asset	20,858	7,370.173 (79,807.3)	0.0002	12.699	69.165	480.7	2,692,538

All of the firm-specific variables are scaled by Total Assets and winsorised at the 1% level, except for Size and Total Assets. Macroeconomic variables are collected on an annual basis. Total assets are in a million unit.
Source. Author’s calculations

The CD (indicated by the total common cash dividend divided by total assets) reports a mean of 0.018 and a standard deviation of 0.028. It shows that on average, firms listed on the LSE only issued 1.8% of their total assets as cash dividends. More interestingly, the Min and P25 (25% or Q1) CD are both zero, which indicates that a considerable number of firms adopt a zero dividend policy. The CD median is only 0.006 (0.6%), the P75 is 0.026 and the Max reports a value of 16.4%. This shows that dividend-paying firms are a small group. For example, firms such as Cenkos Securities PLC have issued substantial cash dividends since they were founded.[50] These are consistent with the findings presented in Table 4.1. The changes in working capital (ΔWC) present a slightly more volatile situation, with a standard deviation of 3.304. The Min and P25 of the ΔWC report -8.711 and -0.295, respectively, which indicates that at least 25 % of the observations exhibited negative changes in their working capital. The negative change could result from a number of financial behaviours such as increases in short-term borrowing and decreases in cash flow. The median, P75 and Max of the ΔWC all show positive figures and the mean also shows a positive value of 0.467, which indicates that the average increase in net working capital is 46.7%. The ΔTP and ΔTR share some similarities. The Min and P25 of ΔTP and ΔTR exhibit negative values. The Median, P75 and Max of these two variables exhibit positive values. The average of ΔTP and ΔTR are 39.5% and 40.2%, respectively. The positive changes in working capital, trade payables, and trade receivables are similar to the findings presented in Figure 4.2. The only difference is that trade payables and trade receivables represent two different components of current liabilities and current assets.

The Div-adj Earnings, however, reports a negative mean value of -0.107. This is a stricter way of reporting earnings, since the dividend-adjusted earnings are calculated as net earnings minus any cash dividends declared. As discussed in Chapter 3, the Div-adj Earnings was adopted to improve the efficiency of estimated models. The negative mean of Divi-adj Earnings suggests that on average, firms' current earnings are not enough to cover their dividend payouts. Another explanation is that firms that do not pay any dividend make negative earnings (losses). Tax displays a mean value of 4.1%. This suggests that firms pay their tax liability over the total assets in cash, at around 4.1%. The Inv variable shows a mean value of 2.8% (over total assets). However, the Min, P25 and Median of Inv are zero. This shows that a large number of firms do not hold any investments (short- or long-term) on their balance sheet.

Gearing has a mean value of 42.574, which represents the long-term debts of 42.57% of the total common equity on average. The Min and P25 of Gearing both report zero, whilst the Max of Gearing is as high as 669.601. Thus, based on the firms' gearing ratios, there are two extreme groups. The first group includes firms that do not hold any long-term debts; these firms rely more on equity finance. The second group includes firms that hold a substantial amount of long-term debts over equity; in short, these firms use debt financing. Since both debt and equity finance have their pros and cons, the

[50] In 2016, Cenkos Securities PLC issued £102.3 million of cash to their shareholders, equivalent to 154.8p per share (for detail see www.cenkos.com/investors).

difference between the two extreme groups is the firm's preference for debt or equity finance. The ROE indicates a mean value of 0.218. The Min and P25 of ROE are -196.812 and -7.381, while the Max of ROE is 109.706. The MtB and EPS report similar results. Interestingly, the Rep displays zero in Min, P25, Median and P75. The Max of Rep is 0.121 which represents 12.1% of the total assets. The Rep reports a mean value of 0.4%. This indicates that firms' stock repurchases are of a small magnitude and most of the firms do not repurchase their stocks.

Table 4.7 compares the descriptive statistics of the variables between young and mature firms.[51] MtB reports a mean of 2.7593% and 2.7655% for young and mature firms, respectively. The p-value is 0.9292. This shows that the MtB of young and mature firms are not significantly different from each other. The p-value of the rest of the variables shows significant value at 1% or 5% significance levels. This indicates that there is a significant difference in the financial performances of young and mature firms.

The biggest difference between young and mature firms is the total assets. The mean of mature firms' total assets variable is nearly six times more than that of the young firms. The Gearing of mature firms is 46.5171%, or 8% higher than for young firms. This means mature firms have more debts, while young firms prefer equity financing. This finding is in line with pecking order theory (Halov and Heider, 2008; Tucker and Stoja, 2011).

The ROE of young firms is about -7%. The mature firms' ROE shows a positive 6.3%. The standard deviation of the ROE variable also shows a bigger value for young firms, but a smaller value for mature firms. This indicates that mature firms have more stable and better performance when investing in their equity compared to young firms. The EPS variable results are very similar to the ROE variable. Both ROE and EPS measure earnings (net incomes) and mature firms earn more than young firms. Young firms report a negative EPS (-0.069), while mature firms show a higher EPS (0.1122). Similarly, the mean of mature firms' Div-adj Earnings variable is much higher than young firms (both are negative values). The Size variable also differs significantly between young and mature firms. The Size of mature firms is 4.64 while for young firms it is 3.36. The Size variable is calculated as the logarithm value of total sales. Therefore, mature firms have more sales revenue than young firms.

The Tax variable indicates that mature firms have more cash flow to cover their tax liabilities than the young firms. Interestingly, the Inv variable of young and mature firms reports a small difference

[51] A firm is considered to be young if the firm was listed on the LSE after the 1st of January 2005, while a firm is classified as mature if the firm was listed on the LSE before the 31st of December 31, 2004. GDP growth and inflation rates are collected at a country's level and they are the same for both young and mature firms. Therefore, they are not included in Table 4.7.

Table 4.7 Summary Statistics between Young and Mature Firms

	Young		Mature			
	Mean	N	Mean	N	t-statistics	p-Value
Gearing (%)	38.194	9,186	46.517	10,205	6.140	0.000***
	(94.762)		(93.806)			
ROE (%)	-7.076	8,167	6.271	9,843	21.173	0.000***
	(48.939)		(35.466)			
MtB (%)	2.759	8,152	2.766	10,143	0.089	0.929
	(5.078)		(4.294)			
EPS	-0.069	8,792	0.112	10,529	7.941	0.000***
	(1.877)		(1.288)			
Rep	0.004	10,093	0.005	10,765	3.555	0.000***
	(0.016)		(0.017)			
Div-adj Earnings	-0.169	10,093	-0.049	10,765	19.879	0.000***
	(0.532)		(0.317)			
ΔTP	0.549	7,515	0.266	8,918	-11.615	0.000***
	(1.918)		(1.172)			
ΔTR	0.559	6,622	0.282	8,648	-9.763	0.000***
	(2.128)		(1.361)			
CD	0.013	10,093	0.023	10,765	23.842	0.000***
	(0.028)		(0.028)			
ΔWC	0.550	8,559	0.391	9,407	-3.219	0.001***
	(3.648)		(2.954)			
Tax	0.030	9,687	0.052	10,031	13.795	0.000***
	(0.111)		(0.112)			
Inv	0.025	10,093	0.028	10,765	2.1580	0.031**
	(0.093)		(0.089)			
Size	3.360	8,558	4.643	10,278	30.467	0.000***
	(2.951)		(2.814)			
Total Assets	2,134.24	10,093	12,299.71	10,765	9.175	0.000***
	(17,009.5)		(110,082.10)			

A firm is grouped as young if its first security trading date is after January 1, 2005. A firm is classified as mature if its first security trading date is before December 31, 2004 on the London Stock Exchange (LSE).
The difference between the two samples is calculated as mean (mature) minus mean (young). *T*-statistic is based on the two-tail *t*-test.
*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

in the mean value (0.025 versus 0.027). However, the *t*-statistic reports a positive value. These ratios reveal that the performance of young and mature firms differs significantly. This is probably due to mature firms' being more profitable than young firms, which results in higher earnings for mature firms. Therefore, the ROE, EPS, Div-adj Earnings are all positive for mature firms. These findings support the life-cycle theory (Muller, 1972).

The p-value indicates that the Inv variable between the young and mature group is different at the 1% significance level. It demonstrates that mature firms have more short- and long-term investments than young firms. In mature firms, the means of Rep and CD variables are higher than in young firms. One thing they both have in common is that the average CD is greater than average of stock repurchase. This shows that regardless of the firms' age, dividend payout is preferred over stock repurchase in corporate payout policy. Grullon and Michaely (2002) came to similar conclusions.

On the contrary, the results of the working capital variables are the opposite. The ΔWC variable is 0.55 for young firms and 0.39 for mature firms. Similarly, the ΔTR and ΔTP variables of young firms are much higher than for mature firms. This shows that the ΔWC variable is more frequent and volatile in young firms than in mature firms. Wilson (2014) argues that trade credit is the only source of external finance for over 90% of small firms, but for only 20% of larger firms. Mature firms have more money to cover their short-term liabilities and have more financial resources than young firms.

Table 4.7 shows the mean of the majority of variables is statistically different between young and mature firms. Based on accounting ratios, mature firms perform much better than young firms. The Life-Cycle Theory (Muller, 1972) argues that young firms have more investment opportunities, but that they have insufficient profits/earnings to meet financial needs. Therefore, returns are volatile and unpredictable for younger firms, especially when the firms are trying to market their products/services and compete with larger firms. When the firms mature, they have higher and less volatile earnings, and more stable cash, and thus are more likely to pay dividends (see also Damodaran, 1989).

4.3 Empirical Findings

This study used the two-step system GMM to estimate cash dividend models (equations (3.17) and (3.18)) for the overall sample. The results are reported in the next section. Section 4.3.2 reveals the dividend payout through the working capital: there is a concave relationship between dividend payout and a change in working capital. The subsamples analyses of dividend payouts is presented in Section 4.3.3. In terms of stock dividends, the sample is relatively small. Therefore, the FE estimator was used to estimate the stock dividend models (equations (3.19) and (3.20)). The findings are reported in section 4.3.4.

4.3.1 Overall Sample Results: Cash Dividends

After excluding the missing value of the data, we had a sample of 20,858 (firm-year) observations for the period of 1991 to 2015. Table 4.8 provides the results of the dynamic cash dividend model (equation (3.17)) for the overall sample. In particular, the dividend-adjusted earnings are used in Model 1, while unadjusted earnings are included in Model 2 for comparative purposes.

We adopted Arellano and Bond's (1991) two-step system GMM estimator. As discussed earlier, this model has controls for endogeneity issues for both models. We used the CD, Rep, Inv, MtB and changes in working capital with lagged levels (t-2) to (t-3) as GMM instruments for the equation. After controlling for endogeneity and serial correlation, the result shows that the number of groups (1,290) is much greater than the number of instruments (410) for Model 1 and 2. The Hansen J-test reports a p-value of 0.123 and 0.143 in Models 1 and 2, respectively. In Model 1, the Difference-Hansen test shows a p-value of 0.141, while in Model 2 it shows a *p*-value of 0.190. These results indicate that the GMM instruments in Models 1 and 2 are valid and our regression results are robust. We specify the "robust" command in our equation when using STATA. Under the two-step system GMM, the standard covariance matrix and standard error are robust in terms of panel autocorrelation and heteroscedasticity (Mileva, 2007).

The results of equation (3.17) are reported in Table 4.8. In terms of the variables of interest, Model 1 shows the Div-adj Earnings variable has no statistically significant impact on dividend payouts. Both Fukuda (2000) and Farsio et al. (2004) also noted an insignificant correlation between earnings and dividend payout. One possible explanation is that earnings can only affect the targeted dividend payout, but they do not reveal a firm's ability to issue a dividend payout. The coefficient of ΔWC is positive and statistically significant, while its squared term (ΔWC^2) is negative and statistically significant in Model 1. This suggests that there exists a concave relationship between working capital and dividend payouts. In other words, a relatively low change in working capital can increase the dividend payout, while a relatively high change in working capital may decrease it. It also demonstrates that working capital is an important determinant of dividend payout, which suggests that working capital can be a great source of finance for dividend payouts.

As previously discussed, an increase in net working capital may be a result of an increase in cash, trade receivables, inventories and/or a decrease in short-term debts. Thus, an increase in cash, via working capital, can be a source for dividend payouts, which explains the positive correlation between working capital and dividend payouts. However, extremely high net working capital may also be the result of high levels of trade receivables, inventories, and a relatively low level of cash. In other words, a firm with insufficient cash has low efficiency in collecting receivables and stocks a lot of unsold inventory. Thus, it is unlikely that the firm will adjust working capital and maintain more cash in such a situation, resulting in a decrease in dividend payouts. If extremely high net working capital is caused primarily by a substantial increase in cash, then a firm is most likely to consider other financial decisions, such as investments, M&As, and R&D expenditures (Mikkelson and Partch, 2003). In this case, working capital would subsequently decrease, and eventually, dividend payouts would decrease as well. Therefore, when WC is greater than the turning point (i.e. 5.428), there is a negative impact on dividend payouts.

In Model 1, the lagged value of CD shows a significant and positive relationship with CD. This confirms results in the correlation matrix (see Table 3.2). Previous studies have also identified a positive (dynamic) relationship (Lintner, 1956; Goddard et al., 2006; Javakhadze et al., 2014). All of these studies argue that the past year's dividend payout has a strong impact on the current dividend payout. In this study, we also found that if a firm issued dividends the previous year, it is likely that the firm would issue dividends in the current year. The coefficient of Tax is positive and significant at the 1% level. Jeong (2013) also finds that dividend is positively affected by tax and interest rates. However, the Tax variable we measure here is slightly different from the literature (mainly tax expenses). In the current study, Tax represents the tax liabilities that have been paid via cash during the financial year. In other words, the Tax variable also indicates a firm's ability to pay its tax liability through cash. The Size coefficient is also positive and significant which is similar to previous studies (see Fama and French, 2001; Dhanani, 2005; Denis and Osobov, 2008 and Kaźmierska-Jóźwiak, 2015). This positive relationship can also be explained by the Life-Cycle Theory (Muller, 1972), which states that young and small firms, with high growth opportunities tend to issue low/no dividends because their cash flows may be low compared to their capital expenditure. When firms mature and make greater profits and have more stable cash flows, they are more likely to issue higher dividends. Since the Size variable is measured through the logarithm value of total sales revenue, one can conclude that the bigger the sales revenue of a firm, the higher the cash dividend payout (Alzahrani and Lasfer, 2012).

A similar result was obtained for the MtB in Model 1. The MtB variable is measured by the difference between the market value and book value of a firm. A higher market-to-book ratio implies that the firm is worth more than its book value which is regarded as a good sign. Our results show that the higher market-to-book ratio, the higher the dividend payout. Tse (2005) argues that market

Table 4.8 Overall Sample Results of Equation (3.17)

Dependent Variable: CD	Model 1	Model 2
CD(t-1)	0.516***	0.515***
	(0.037)	(0.037)
ΔWC^2	- 0.088***	-0.086***
	(0.031)	(0.031)
ΔWC	0.955**	0.909*
	(0.479)	(0.472)
Div-adj Earnings	**0.060**	
	(1.491)	
Unadjusted Earnings		**1.151****
		(1.929)
Tax	19.833***	19.643***
	(3.361)	(3.408)
Inv	0.191	0.078
	(6.236)	(6.193)
Gearing (%)	- 0.052***	-0.052***
	(0.010)	(0.010)
MtB (%)	1.317***	1.321***
	(0.205)	(0.205)
Size	2.850***	2.766***
	(0.434)	(0.428)
Rep(t-1)	- 21.065	-20.342
	(16.740)	(16.678)
Dum(fs)	0.061	0.131
	(0.536)	(0.540)
GDPg (%)	0.114*	0.120*
	(0.069)	(0.070)
Inf (%)	- 0.205	-0.204
	(0.132)	(0.132)
Constant	-3.907**	-3.534**
	(1.628)	(1.614)
m_2	0.276	0.276
Hansen J-test (*p*-value)	0.123	0.143
Diff-Hansen test (*p*-value)	0.141	0.190
Number of observations	14,221	14,221

Dynamic cash dividend (CD) regression with explanatory variables. Estimation is by two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity and within the firm's serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets.

The results presented in Models 1 and 2 are estimated based on equation (3.17). The dividend-adjusted earnings are included in Model 1, while the unadjusted earnings are included in Model 2.

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations

Table 4.9 Overall Sample Results of Equation (3.18)

Dependent Variable: CD	Coefficients	*t*-statistics	*p*-value
CD(t-1)	0.723	16.270	0.000***
	(0.0445)		
ΔTP	-0.839	-1.750	0.081*
	(0.481)		
ΔTR	-0.128	-0.310	0.758
	(0.414)		
Div-adj Earnings	-4.504	-2.000	0.046**
	(2.250)		
Tax	17.187	5.080	0.000***
	(3.382)		
Inv	-12.273	-1.800	0.072*
	(6.825)		
Gearing (%)	-0.034	-3.740	0.000***
	(0.009)		
MtB (%)	1.021	4.820	0.000***
	(0.212)		
Size	1.712	3.660	0.000***
	(0.468)		
Rep(t-1)	15.103	0.360	0.720
	(42.136)		
Dum(fs)	-0.881	-1.480	0.138
	(0.594)		
GDPg (%)	0.143	1.750	0.080*
	(0.082)		
Inf (%)	-0.102	-0.730	0.463
	(0.139)		
Constant	-3.576	-1.950	0.051*
	(1.833)		
m_2			0.153
Hansen J-test (*p*-value)			0.220
Diff Hansen (*p*-value)			0.197
Number of observations			12,274

Dynamic cash dividend (CD) regression with explanatory variables. Estimation is by two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets.
In equation (3.18), the working capital is split into trade payables and trade receivables.
*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

capitalisation and asset book value are one of the major determinants of a firm issuing dividends in the UK stock market. Fama and French (2001) and Amidu and Abor (2006) disagree. They all found a negative relationship between dividend payout and market-to-book value in the US and Ghana stock markets, respectively. In Model 1, the Gearing coefficient is negative and significant in the regression result. This shows that a higher gearing ratio implies less dividend payout (Benito and Young, 2003). A higher Gearing ratio means higher long-term debts over total common equity, therefore, firms have more debts to pay and fewer funds to distribute to shareholders (Aivazian et al., 2003).

The results in Model 1 also show that the coefficient of Inv, Rep (t-1), and Dum (fs) are insignificant. The Inv insignificant coefficient of Inv indicates that no matter how much a firm holds in short-term or long-term investments, dividend payout policy is irrelevant (Gul, 1999; Wang, 2010). The Rep (t-1) coefficient is insignificant as well. We found that stock repurchases do not dominate cash dividends (Barclay and Smith, 1988). Our finding contradicts the substitution hypothesis between dividend and stock repurchase (Grullon and Michaely, 2002; Skinner, 2008). We argue that stock repurchase is not a substitute for cash dividends, and that cash dividends remain a dominant form of corporate payout in the UK context. Interestingly, the Dum (fs) is insignificant, even though observed some drops in dividends during the financial crisis period. According to our empirical results in Model 1, the financial shocks of 2008 and 2012 did not have a significant impact on the LSE firms' dividend payouts. The GDPg variable is significant and positively correlated with firm dividend payouts in Model 1. The Inf variable has a negative impact on a firm's dividend payout, but this relationship is not significant at any level. To some extent, the varied results indicate that macroeconomic variables play a role in explaining dividend payouts (except for Inf). The significant result of the GDPg demonstrates that in a healthy economy, the higher dividend payouts are (Bozos et al., 2011).

For comparative purposes, we also present the results that capture the effect of unadjusted earnings on dividend payouts in Model 2 (see Table 4.8 second column). Our estimates show that Unadjusted Earnings have a positive and statistically significant effect on dividend payouts. The finding differs from Model 1, where estimates using Div-adj Earnings were not adjusted. This is not surprising since dividend payout information is included in the unadjusted earnings variable. The negative and insignificant coefficient of Div-adj Earnings can be explained by the fact that most of the firms' current earnings are insufficient to cover their dividend payouts. With respect to other coefficients, including the coefficient of working capital variables, we find similar signs and significance levels in Models 1 and 2.

After dividing working capital into trade receivables and trade payables, we further examined the significance of these two variables on dividend payouts (equation (3.18)). Again, we adopted the two-step system GMM estimation in our regression, whilst the ΔWC is replaced and no longer exists in equation (3.18). We used CD, Rep (t-1), Inv and MtB, ΔTR and ΔTP lagged levels (t-2) to (t-3) as GMM instruments for the equitation. The results are shown in Table 4.9. The number of groups is 1,172, and the number of instruments is 454. The Hansen J-test reports a p-value of 0.22 and the Difference-Hansen test shows a p-value of 0.197. The Hansen test is a validity test of the instrument which checks for over-identifying restrictions. The Hansen J-test results indicate that our GMM instruments are valid. The standard covariance matrix and standard error are robust in terms of panel autocorrelation and heteroscedasticity.

After the split of ΔWC, we ran the regression using equation (3.18). The results are reported in Table 4.9. The coefficient of the first lag of the CD remains positive and significant at the 1% level. This indicates that there is a dynamic relationship in the cash dividend payout (Lintner, 1956; Goddard et al., 2006; Javakhadze et al., 2014).

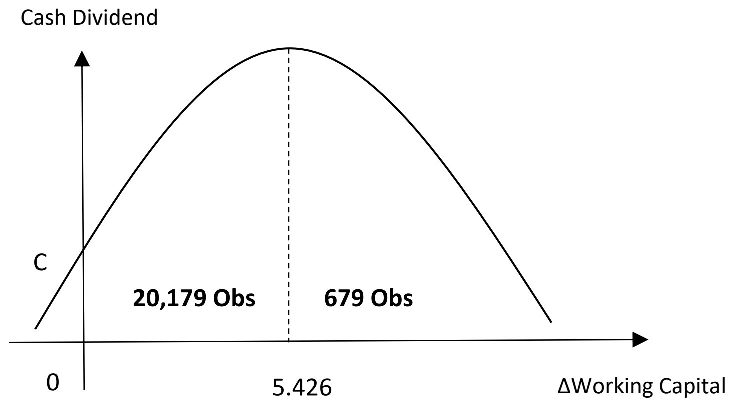
Surprisingly, we found a significant and negative relationship between the ΔTP and dividend payouts. From the descriptive statistics (see Figure 4.2), the level of trade payables exhibits an increasing trend, from 1991 to 2005. The ΔTP mean is 0.39. These show that the average LSE firms' trade payables increased over the study period. Trade payables are a firm's current liabilities. The negative relationship we observed reveals that an increase in trade payables will lead to a decrease in dividend payouts. An increase in trade payables is a source of cash. However, a firm may have different priorities for utilising additional funds. Traditionally, an increase in trade payables is associated with firms' day-to-day operations, and the cash generated through this process are often included in the operating cash flow part. Trade payables are short-term debts due within a short time period (less than 12 months). Firms may use this cash for the dividend payout. While this may satisfy most shareholders' demand for dividends it puts the firm under pressure to pay off their short-term debts. Failing to repay its debtholders is not a good option, either. Therefore, the negative relationship (between trade payable and dividend payout) reveals that firms are reluctant to use cash generated from short-term debt to issue dividend payouts. This cash is more likely to be used for firms' day-to-day operations rather than for dividend payouts. When the short-term debts are due, firms need to pay both the principal amount and the interest. We also found that the ΔTR coefficient is insignificant in the model. Similarly, the Rep (t-1) variable is not significant, at any level, which demonstrates that dividend payouts are not be affected by any stock repurchase policies (Grullon and Michaely, 2002; Skinner, 2008). The Tax, MtB, Size and GDPg variables are significant and positively correlated with dividend payouts. The Gearing variable exhibits a negative relationship with dividend payouts. The results of the control variables (except for Div-adj Earnings and Inv) are consistent with the findings of equation (3.17) (see Table 4.8). This also shows that the GMM estimates provide consistent and robust results.

However, the result shows the Div-adj Earnings and Inv coefficients are negative and significant after we split the working capital into trade receivables and trade payables. This means that the firms' earnings are negatively related to dividend payout (see Pettit, 1976 and Ferris et al. 2006). In fact, there are a number of firms with negative earnings that issued dividends on the LSE. Higher losses may force the firms to improve their earnings in the following year, which indicates a relatively higher market value in the future (Burgstahler and Dichev, 1997). Thus, firms are likely to issue dividends regardless of negative earnings. The Inv coefficient reports a negative and significant sign (Adedeji, 1998). Less available cash for dividend payouts may be the result of more investments in firm projects.

4.3.2 Dividend Payout: Subsample Analysis

According to the findings displayed in Table 4.8, the negative and positive coefficients of ΔWC^2 and ΔWC jointly indicate that a change in working capital has a concave relationship to dividend payouts (see Figure 4.5). In order to calculate the turning point, we took the derivative of CD, with respect to ΔWC on the right side of the estimated equation (3.17), and set the equation to zero. We found that when ΔWC equals 5.426, the CD reaches its maximum value. In other words, an increase in working capital increases the dividend payout with the maximum effect occurring at 5.426 per cent. At higher working capital levels (anything exceeding the turning point of 5.426 per cent), the dividend payout declines.

Figure 4.5 Dividend Payout and Changes in Working Capital



The figure is based on the estimated results (equation (3.17)) in Table 4.8 when all else is held constant. The estimated equation can be rewritten as: $CD = -0.088\Delta WC^2 + 0.955\Delta WC + Constant$
Source: Author's calculations

This is because an increase in net working capital helps a firm to maintain more cash, which positively affects the dividend payout. However, when the change in working capital is greater than

5.426, it has a negative impact on CD. When net working capital increases dramatically (over the turning point), then a firm may use the extra net working capital for other financial purposes (such as investments or mergers and acquisitions). Once the firm proceeds with these financial behaviours, additional net working capital would decrease, and the dividend payout may decline as well.

Figure 4.5 shows that there are 679 observations with a change in working capital higher than 5.426 and 20,179 observations have a change in working capital less than 5.426, in the overall sample. Based on this turning point, the overall sample is divided into two categories: a "ΔWC < 5.426" group (20,179 Obs) and a "ΔWC ≥ 5.426" group (679 Obs). We compare firms' characteristics and report the difference between these two groups of firms.

Table 4.10 shows the CD mean is 1.8% and 1.3% in the "ΔWC < 5.426" group and the "ΔWC ≥ 5.426" group, respectively. Apparently, the average ΔWC in the "ΔWC ≥ 5.426" group is much higher than the "ΔWC < 5.426" group. These are consistent with the findings illustrated in Figure 4.5. Similarly, the "ΔWC ≥ 5.426" group has a higher mean of ΔTP and ΔTR, compared to the "ΔWC < 5.426" group. The standard deviations of the working capital variables are much higher in the "ΔWC ≥ 5.426" group, which suggests that working capital is more volatile in the "ΔWC ≥ 5.426" group. The t-test of CD and working capital variables reports a significant (at the 1% level) difference between the "ΔWC < 5.426" group and the "ΔWC ≥ 5.426" group. The Tax variable indicates that firms in the "ΔWC < 5.426" group pay significantly more cash for their tax liabilities compared to firms in the "ΔWC ≥ 5.426" group. The firms in the "ΔWC ≥ 5.426" group have lower Gearing compared to firms in the "ΔWC < 5.426" group. Regarding ROE, EPS and Size variables, the firms in the "ΔWC < 5.426" group perform better than firms in the "ΔWC ≥ 5.426" group. However, the Div-adj Earnings, Inv, MtB, Rep (t-1) and Total Assets variables do not show any significant difference between these two groups.

After backtesting, we found that there are 1,048 firms whose changes in working capital did not exceed the turning point (5.426) during the study period. The rest of the firms (527), exceed the turning point, but only for some periods. In other words, these 527 firms are located in both areas ("ΔWC < 5.426" group and "ΔWC ≥ 5.426" group) in Figure 4.5. While 1,048 firms are in the "ΔWC < 5.426" group only.

According to these findings, we obtained two subsamples: a positive and negative group and a positive group. Similarly, we found the lag dividend payout is positively correlated with the dividend payout and that the relationship is significant in both of the subsamples. We observed consistent results for the Tax, Gearing, MtB, Size, and GDPg coefficients in both of the subsamples compared to the main findings (see Table 4.8). The Div-adj Earnings, Inv, Rep (t-1), Dum (fs) and Inf coefficients are not significant in either the positive group or the positive and negative group. As expected, the results

Table 4.10 Firm Characteristics (ΔWC < 5.426 versus ΔWC ≥ 5.426)

Variables	ΔWC < 5.426		ΔWC ≥ 5.426		*t*-statistics	*p*-value
	Mean	N	Mean	N		
CD	0.018	20,179	0.013	679	4.964	0.000***
	(0.028)		(0.028)			
ΔWC	-0.049	17,287	13.593	679	-1.7e+02	0.000***
	(1.614)		(6.591)			
ΔTP	0.372	15,850	1.018	583	-9.818	0.000***
	(1.505)		(2.655)			
ΔTR	0.385	14,800	0.935	470	-6.749	0.000***
	(1.702)		(2.652)			
Div-adj earnings	-0.107	20,179	-0.120	679	0.780	0.435
	(0.440)		(0.410)			
Tax	0.042	19,039	0.024	679	4.109	0.000***
	(0.112)		(0.100)			
Inv	0.026	20,179	0.028	679	-0.566	0.571
	(0.090)		(0.105)			
Gearing (%)	42.789	18,766	36.122	625	1.738	0.082*
	(94.716)		(82.374)			
ROE (%)	0.440	17,406	-6.160	604	3.742	0.000***
	(42.205)		(53.165)			
MtB (%)	2.757	17,703	2.933	592	-0.904	0.366
	(4.655)		(4.789)			
EPS	0.035	18,694	-0.141	627	2.744	0.006***
	(1.560)		(2.216)			
Size	4.086	18,261	3.230	575	6.866	0.000***
	(2.929)		(3.369)			
Repurchase	0.004	20,179	0.005	679	-0.534	0.594
	(0.017)		(0.017)			
Total Assets	7,543.293	20,179	2,549.643	679	1.597	0.110
	(81,403.850)		(15,809.470)			
No. of observations	20,179		679			

The difference between the two samples is calculated as mean ("ΔWC < 5.426" group) minus mean ("ΔWC ≥ 5.426" group). *T*-statistic is based on the two-tail t-test.
*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

Table 4.11 Subsample Results of Positive Group versus Positive and Negative Group

Dependent Variable: CD	Positive Group		+ and - Group		Sig. of Diff.
	Coefficients	*p*-value	Coefficients	*p*-value	
CD(t-1)	0.494	0.000***	0.533	0.000***	0.577
	(0.042)		(0.056)		
ΔWC^2	**NOT INCLUDED**	**n.a.**	-0.025	0.031**	n.a.
	(n.a.)		(0.021)		
ΔWC	1.517	0.038**	0.280	0.045**	0.130
	(0.730)		(0.366)		
Div-adj Earnings	-4.328	0.168	3.363	0.122	0.026**
	(3.133)		(1.466)		
Tax	32.416	0.000***	16.577	0.000***	0.021**
	(5.291)		(4.368)		
Inv	7.306	0.416	-0.057	0.995	0.548
	(8.972)		(8.342)		
Gearing (%)	-0.068	0.000***	-0.033	0.001***	0.042**
	(0.014)		(0.010)		
MtB (%)	1.529	0.000***	1.151	0.000***	0.295
	(0.277)		(0.232)		
Size	2.693	0.000***	1.860	0.000***	0.251
	(0.566)		(0.455)		
Rep(t-1)	-29.452	0.183	12.085	0.613	0.202
	(22.124)		(23.845)		
Dum(fs)	-0.812	0.346	1.215	0.252	0.138
	(0.861)		(1.060)		
GDPg (%)	0.211	0.048**	0.172	0.082**	0.788
	(0.107)		(0.098)		
Inf (%)	-0.242	0.219	-0.142	0.486	0.723
	(0.196)		(0.203)		
Constant	-3.097	0.174	-1.392	0.400	0.545
	(2.279)		(1.651)		
m_2		0.234		0.899	
Hansen J-test (*p*-value)		0.264		0.262	
Diff-Hansen (*p*-value)		0.409		0.128	
Number of observations		8,758		5,463	

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors (shown in brackets) are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. The significance difference in coefficients uses the absolute value of z test statistics, where $Z = (b_1 - b_2)/\sqrt{SE_{b1}^2 + SE_{b2}^2}$
*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

present a concave relationship between ΔWC and dividend payout for 527 firms in the positive and negative group; this relationship changes to linear when the ΔWC^2 variable is excluded in the positive group. The ΔWC coefficient reports a positive sign in the positive group which suggests that the ΔWC has a positive impact on the dividend payout for these 1,048 firms. Therefore, the concave relationship in the overall sample is a combined result of a positive linear relationship (in 1,048 firms) and a concave correlation (in 527 firms).

In fact, a firm's working capital could change from time to time. The firms in the positive group in the *t* period do not necessarily stay in the positive group in the (t+1) period. These 527 firms shift from the positive group to the negative group, from time to time. Combining Figure 4.5, Tables 4.10 and 4.11, one can infer that the majority of firms listed on the LSE have relatively low changes in their working capital and only part of the firms have a higher change in working capital. This suggests that the positive linear relationship between net working capital and the dividend payout works for most of the firms (see also the regression results in the positive group), whilst the concave correlation between net working capital and dividend payouts are only robust for a few of the firms (with higher changes in working capital) listed on the LSE. In other words, firms located in both areas ("ΔWC < 5.426" and "ΔWC ≥ 5.426" group) are able to adjust their dividend payouts via working capital.

To conclude, the dividend payout depends on changes in working capital holding all else constant. Firms with lower changes in their working capital (the 1,048 firms) display a positive relationship with dividend payouts. However, this does not imply that the positive relationship between changes in working capital and dividend payout holds all of the time. Once a firm's change in working capital reaches over the turning point (of 5.426), the relationship shifts to the opposite side (decreasing the dividend payout). Similarly, firms with higher changes in their working capital (greater than the turning point) present a concave correlation. If these firms fail to maintain a high change in their working capital, they move to the positive group. Therefore, our findings show that only a small number of firms (527) are capable of increasing/decreasing dividend payouts using their working capital. For the majority of firms (1,048) listed on the LSE, this is not applicable. Nevertheless, the inference is that these 1,048 firms can increase their working capital in order to change (increase or decrease) their dividend payouts.

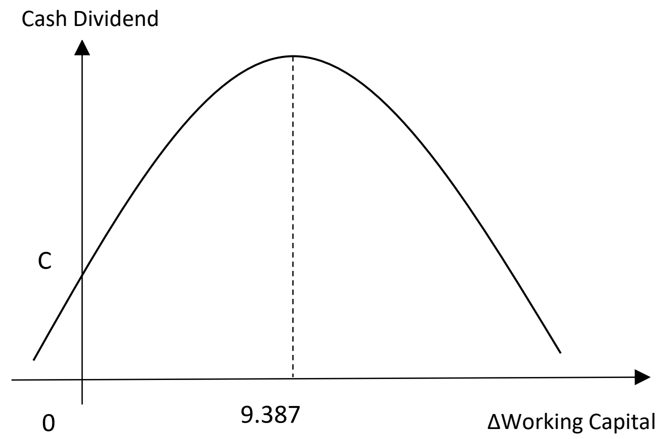
4.3.3. Subsample Analysis

We divide the overall sample into financial firms and non-financial firms; young versus mature groups; firms listed on the Main Market (MM) versus the Alternative Investment Market (AIM); firms with sufficient working capital (Above Average WC) versus firms with insufficient working capital (Below

Average WC) and the high volatility in sales group versus the low volatility in sales group. We re-ran the cash dividend models (equations (3.17) and (3.18)). The results are reported below.

The first subsamples are categorised as financial firms and non-financial firms. As argued by Baker and De Ridder (2018), financial firms, especially banks, and industrial firms show substantial differences. Based on the descriptive analyses in Table 4.2 and Figure 4.2, we divided the sample into financial and non-financial firms and reran the estimates. Using the same GMM estimation, the results are reported in Tables 4.12 and 4.13. Table 4.12 shows the results of equation (3.17) for financial and non-financial firms. The first lag of CD is positively correlated with the dependent variable CD in both subsamples. The ΔWC coefficient displays a positive and significant sign and its square term reports a negative and significant value, suggesting that there exists a concave relationship between working capital and dividend payouts for financial and non-financial firms.

Figure 4.6 Non-financial Firms: Dividend Payout and Changes in Working Capital



The figure is based on the estimated results (equation (3.17)) in Table 4.12 when all else is held constant. The estimated equation can be rewritten as: $CD = -0.075\Delta WC^2 + 1.408\Delta WC + Constant$.
Source: Author's calculations

Div-adj Earnings are not significant in both subsets. The results also show that the dividend payout does not change significantly because of external financial shocks for financial firms and non-financial firms. However, there is a critical issue in the subsample of financial firms. The number of groups is less than the number of instruments (same as the overall sample and other subsamples). A large number of instruments may lead to the standard error downward bias and can overfit endogenous variables, failing to expunge their endogenous components and leading to biased coefficient estimates (Roodman, 2009). Because of the issue, the GMM results reported in Table 4.12 for financial firms are spurious. One should interpret these results with caution. The concave relationship between working capital and dividend payout for non-financial firms are displayed in Figure 4.6. Holding all else constant, we calculated the turning point of (ΔWC) to be 9.387 per cent. This indicates that at low levels of working capital, an increase in working capital increases the dividend payout with a maximum effect

Table 4.12 Subsample (Financial firms vs. Non-financial firms) Results of Equation (3.17)

Dependent variable: CD	Financial firms		Non-financial firms		Sig. of diff.
	Coefficients	*p*-value	Coefficients	*p*-value	
CD(t-1)	0.639	0.000***	0.473	0.000***	1.974**
	(0.075)		(0.038)		
ΔWC^2	-0.075	0.018**	-0.115	0.001***	0.883
	(0.031)		(0.033)		
ΔWC	1.408	0.008***	0.889	0.082*	0.709
	(0.525)		(0.510)		
Div-adj Earnings	-5.134	0.308	-0.158	0.932	0.930
	(5.023)		(1.846)		
Tax	40.071	0.000***	16.291	0.000***	2.209**
	(10.212)		(3.413)		
Inv	-13.111	0.270	-1.363	0.832	0.872
	(11.842)		(6.424)		
Gearing (%)	-0.031	0.018**	-0.061	0.000***	1.696*
	(0.013)		(0.012)		
MtB (%)	1.099	0.001***	1.444	0.000***	0.878
	(0.326)		(0.219)		
Size	1.585	0.058*	3.447	0.000***	1.919*
	(0.830)		(0.503)		
Rep(t-1)	-22.400	0.790	-11.465	0.474	0.128
	(83.892)		(16.002)		
Dum(fs)	-0.066	0.964	0.091	0.889	0.099
	(1.448)		(0.652)		
GDPg (%)	0.313	0.228	0.131	0.095*	0.673
	(0.259)		(0.078)		
Inf (%)	-0.654	0.133	-0.268	0.075*	0.841
	(0.434)		(0.150)		
Constant	1.756	0.454	-5.363	0.003***	2.410**
	(2.343)		(1.799)		
m_2		0.851		0.342	
Hansen J-test (*p*-value)		0.780		0.271	
Diff-Hansen (*p*-value)		0.392		0.277	
Number of observations		1,840		12,381	

Dynamic cash dividend (CD) regression is estimated by two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors (shown in brackets) are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. The significance difference in coefficients uses the absolute value of *z* test statistics, where $Z = (b_1 - b_2)/\sqrt{SE_{b1}^2 + SE_{b2}^2}$
*, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.
Source: Author's calculations

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Table 4.13 Subsample (Financial firms vs. Non-financial firms) Results of Equation (3.18)

Dependent variable: CD	Financial firms		Non-financial firms		Sig. of diff.
	Coefficients	*p*-value	Coefficients	*p*-value	
CD(t-1)	0.625	0.000***	0.486	0.000***	1.538
	(0.082)		(0.038)		
ΔTP	-1.416	0.184	-0.900	0.006***	0.426
	(1.061)		(0.587)		
ΔTR	0.488	0.552	-0.100	0.012**	0.639
	(0.818)		(0.421)		
Div-adj Earnings	-9.264	0.237	-1.676	0.391	0.944
	(7.800)		(1.953)		
Tax	42.276	0.000***	21.935	0.000***	1.719*
	(11.179)		(3.889)		
Inv	-12.692	0.298	-0.458	0962	0.792
	(12.164)		(9.525)		
Gearing (%)	-0.047	0.005***	-0.044	0.000***	0.159
	(0.016)		(0.010)		
MtB (%)	0.814	0.007***	1.270	0.000***	1.310
	(0.296)		(0.183)		
Size	2.268	0.048**	3.317	0.000***	0.853
	(1.137)		(0.469)		
Rep(t-1)	-29.272	0.693	-15.825	0.316	0.178
	(74.001)		(15.781)		
Dum(fs)	-1.771	0.354	0.151	0.755	0.979
	(1.903)		(0.485)		
GDPg (%)	0.131	0.725	0.223	0.004***	0.242
	(0.372)		(0.077)		
Inf (%)	-1.049	0.055*	-0.136	0.339	1.627*
	(0.543)		(0.142)		
Constant	2.081	0.579	-6.763	0.000***	2.119**
	(3.740)		(1.854)		
m_2		0.922		0.368	
Hansen J-test (*p*-value)		**1.000**		0.187	
Diff-Hansen (*p*-value)		**1.000**		0.350	
Number of observations		1,276		10,998	

Dynamic cash dividend (CD) regression is estimated by two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors (shown in brackets) are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. The significance difference in coefficients uses the absolute value of *z* test statistics, where $Z = (\mathrm{b}_1 - \mathrm{b}_2)/\sqrt{\mathrm{SE}_{\mathrm{b}1}^2 + \mathrm{SE}_{\mathrm{b}2}^2}$

In equation (3.18), the working capital is split into trade payables and trade receivables.

*, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

Source: Author's calculations

occurring at 9.387 per cent; after the turning point, an increase in working capital decreases the dividend payout.

Table 4.13 reports the results of equation (3.18) for financial and non-financial firms. Likewise, the number of instruments is greater than the number of groups, thus the results of financial firms are spurious. Both the Hansen J-test and Diff-Hansen test report a *p*-value of 1.00, which also suggest that the results are not reliable for financial firms.[52] In terms of non-financial firms, the change in trade payables and change in trade receivable are negatively correlated with the dividend payout. This is similar to our findings in the positive and negative group. The dummy variable financial shock coefficient is not significant for non-financial firms. Most of the coefficients of the control variables are consistent with findings in the overall sample.

We collected information regarding security start dates for all of the firms. We divided the full sample into two categories: young and mature firms.[53] We adopted the same method (two-step system GMM) for the subsamples. The results are shown in Tables 4.14 and 4.15. Table 4.14 reports equation (3.17) results for young and mature firms. The result shows that the number of instruments is less than the number of groups for both subsamples. A large number of instruments may lead to standard error downward bias and can overfit endogenous variables, failing *to* expunge their endogenous components and lead to biased coefficient estimates (Roodman, 2009). The J-test and Difference Hansen test are reported. The results indicate that our GMM instruments are valid. The first lag of CD is positively significant in both subsamples. The ΔWC^2 displays a negative and significant sign and the ΔWC variable is not significant in the mature firms group. This also indicates the concave relationship between change in working capital and CD. However, the ΔWC^2 and ΔWC coefficients are not significant in the young firms group. These indicate that the nonlinear impact of working capital on CD is more significant in the mature firms group. In mature firms, low changes in working capital will have a positive impact on dividend payouts, while high changes in working capital would lead to a decrease in dividend payouts. Next, we calculated the turning point of the change in working capital for mature firms (see Figure 4.7). The result shows that when ΔWC is less than 2.121 for mature firms, it has a positive impact on CD; when ΔWC is greater than 2.121, it has a negative effect on CD. Since the results (the coefficients of ΔWC and ΔWC^2) are not significant for the young firms group, the turning point of ΔWC is not reported here. Mature firms have more stable working capital and cash

[52] Apart from GMM estimation, we adopted the FE model for financial firms. The results show that the concave relationship between the ΔWC and the Div is still significant; and ΔTP, ΔTR are negatively correlated with the Div. Similarly, the Div-adj earnings and dum (fs) coefficients are significant. These results are available upon request.

[53] We define firms listed after 31/12/2004 as young firms, and those firms listed before 31/12/2004 as matured firms.

Table 4.14 Subsample (Mature vs. Young) Results of Equation (3.17)

Dependent Variable: CD	Mature		Young		Sig. of Diff.
	Coefficients	*p*-value	Coefficients	*p*-value	
CD(t-1)	0.536	0.000***	0.486	0.000***	0.707
	(0.051)		(0.049)		
ΔWC^2	-0.070	0.031**	-0.044	0.112	2.681***
	(0.032)		(0.028)		
ΔWC	0.297	0.485	0.876	0.299	0.852
	(0.424)		(0.531)		
Div-adj Earnings	-1.907	0.473	-1.070	0.670	0.229
	(2.657)		(2.509)		
Tax	20.456	0.000***	31.787	0.000***	1.486
	(4.117)		(6.418)		
Inv	-3.411	0.627	9.198	0.395	0.979
	(7.015)		(10.803)		
Gearing (%)	-0.049	0.000***	-0.047	0.003**	0.109
	(0.009)		(0.016)		
MtB (%)	1.250	0.000***	1.497	0.000***	0.661
	(0.227)		(0.297)		
Size	2.470	0.000***	2.997	0.000***	0.687
	(0.429)		(0.636)		
Rep(t-1)	3.465	0.840	-53.279	0.140	1.422
	(17.172)		(36.045)		
Dum(fs)	-0.507	0.524	0.898	0.435	1.006
	(0.793)		(1.150)		
GDPg (%)	0.207	0.039**	0.190	0.148	0.103
	(0.100)		(0.132)		
Inf (%)	-0.013	0.944	-0.3665	0.140	1.160
	(0.177)		(0.248)		
Constant	-3.019	0.097*	-4.401	0.076*	0.450
	(1.816)		(2.473)		
m_2		0.445		0.429	
Hansen J-test (*p*-value)		0.312		0.773	
Diff-Hansen (*p*-value)		0.380		0.292	
Number of observations		8,337		5,846	

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors (shown in brackets) are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. The significance difference in coefficients uses the absolute value of z test statistics, where $Z = (b_1 - b_2)/\sqrt{SE_{b1}^2 + SE_{b2}^2}$
*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author’s calculations

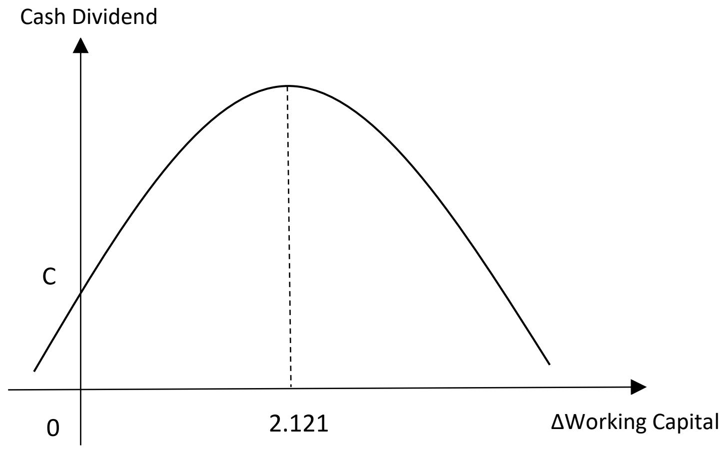
Table 4.15 Subsample (Mature vs. Young) Results of Equation (3.18)

Dependent Variable: CD	Mature		Young		Sig. of Diff.
	Coefficients	*p*-value	Coefficients	*p*-value	
CD(t-1)	0.788	0.000***	0.483	0.000***	4.490***
	(0.040)		(0.055)		
ΔTP	-1.382	0.038**	-0.095	0.899	1.481
	(0.664)		(0.744)		
ΔTR	-0.959	0.016**	-0.640	0.208	0.495
	(0.397)		(0.509)		
Div-adj Earnings	-5.346	0.175	-1.988	0.484	0.692
	(3.936)		(2.838)		
Tax	13.884	0.000***	35.881	0.000***	2.844***
	(3.608)		(6.840)		
Inv	-0.098	0.990	10.345	0.474	0.632
	(8.075)		(14.428)		
Gearing (%)	-0.027	0.000***	-0.044	0.010***	0.917
	(0.007)		(0.017)		
MtB (%)	0.835	0.000***	1.303	0.000***	1.308
	(0.185)		(0.306)		
Size	1.325	0.000***	2.989	0.000***	2.301**
	(0.373)		(0.620)		
Rep(t-1)	-45.516	0.197	-12.230	0.771	0.607
	(35.223)		(42.08)		
Dum(fs)	-1.917	0.050**	0.027	0.982	1.250
	(0.977)		(1.211)		
GDPg (%)	0.154	0.221	0.103	0.490	0.261
	(0.126)		(0.149)		
Inf (%)	0.300	0.224	-0.436	0.136	1.910
	(0.180)		(0.292)		
Constant	-2.965	0.068*	-4.360	0.051*	0.506
	(1.619)		(2.234)		
m_2		0.249		0.370	
Hansen J-test (*p*-value)		0.389		0.900	
Difference Hansen (*p*-value)		0.418		1.000	
Number of observations		7,448		4,794	

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors (shown in brackets) are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. The significance difference in coefficients uses the absolute value of z test statistics, where $Z = (b_1 - b_2)/\sqrt{SE_{b1}^2 + SE_{b2}^2}$
In equation (3.18), working capital is split into trade payables and trade receivables.
*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author’s calculations

flows compared to young firms. Young firms have more growth opportunities and more volatile levels of working capital. Therefore, it is likely that the working capital variable is more significant in the mature firms than in the young firms. The majority of control variable coefficients indicate similar results compared to our full sample results (see Table 4.8 and 4.9). The Dum (fs) is not significant in the subsamples.

Figure 4.7 Mature Firms: Dividend Payouts and Changes in Working Capital



The figure is based on the estimated results (equation (3.17)) in Table 4.14 when all else is constant. The estimated equation can be rewritten as: $CD = -0.070\Delta WC^2 + 0.297\Delta WC + Constant$.
Source: Author's calculations

After splitting the change in working capital into trade payables and trade receivables, we re-ran equation (3.18) for both of the subsamples. The results are reported in Table 4.14. The results show that the number of groups is larger than the number of instruments for both subsamples. The first lag of CD reports similar results to previous ones. The change in trade payables displays a negative coefficient in both the young and mature firms groups. This is similar to our findings in the full sample. The change in trade receivables also reports a negative coefficient in both the young and mature firm samples. This means that a trade receivables increase of 0.959 will lead to a decrease in CD (by 1 unit). In other words, if trade receivables increase (which indicates more transactions are made via trade credit), this allows customers/clients to delay their cash payment to firms and therefore, firms will have less cash available for distributing cash dividends.

However, changes in trade payables and receivable variables are not significant in our young firms group. Further, the Difference-Hansen test of the mature firms' group is 1.00, which indicates that the number of GMM instruments is suspicious in the model. Therefore, equation (3.18) results in the subsample of young firms are questionable. Correspondingly, the findings of the control variables are similar to the full sample. The Dum (fs) is not significant in young firms but negatively significant in mature firms.

Table 4.16 Subsample (MM vs. AIM) Results of Equation (3.17)

Dependent Variable: CD	Main Market		AIM		
	Coefficients	*p*-value	Coefficients	*p*-value	Sig. of Diff.
CD(t-1)	0.508	0.000***	0.470	0.000***	0.557
	(0.042)		(0.049)		
ΔWC²	-0.069	0.019**	-0.055	0.370	0.048
	(0.294)		(0.031)		
ΔWC	0.533	0.025**	1.050	0.407	0.733
	(0.467)		(0.527)		
Div-adj Earnings	-9.777	0.440	-2.355	0.250	1.413
	(4.840)		(2.044)		
Tax	33.987	0.000***	19.003	0.000***	2.100**
	(5.853)		(4.082)		
Inv	-4.300	0.548	7.460	0.194	1.282
	(7.154)		(5.743)		
Gearing (%)	-0.056	0.000***	-0.039	0.002***	1.024
	(0.011)		(0.013)		
MtB (%)	1.809	0.000***	0.999	0.000***	2.288**
	(0.243)		(0.257)		
Size	1.570	0.016**	3.876	0.000***	2.368**
	(0.650)		(0.725)		
Rep(t-1)	13.169	0.539	-71.916	0.170	2.306**
	(21.437)		(30.028)		
Dum(fs)	-0.530	0.604	0.445	0.555	0.768
	(1.020)		(0.755)		
GDPg (%)	0.219	0.054*	0.179	0.101	0.257
	(0.113)		(0.109)		
Inf (%)	0.154	0.466	-0.530	0.014	2.267**
	(0.211)		(0.2160)		
Constant	3.98	0.914	-3.694	0.072*	1.821*
	(3.679)		(2.051)		
m_2		0.216		0.967	
Hansen J-test (*p*-value)		0.146		0.251	
Difference Hansen (*p*-value)		0.395		0.304	
Number of Observations		7,484		6,737	

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors (shown in brackets) are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. The significance difference in coefficients uses the absolute value of z test statistics, where $Z = (b_1 - b_2)/\sqrt{SE_{b1}^2 + SE_{b2}^2}$

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations

Table 4.17 Subsample (MM vs. AIM) Results of Equation (3.18)

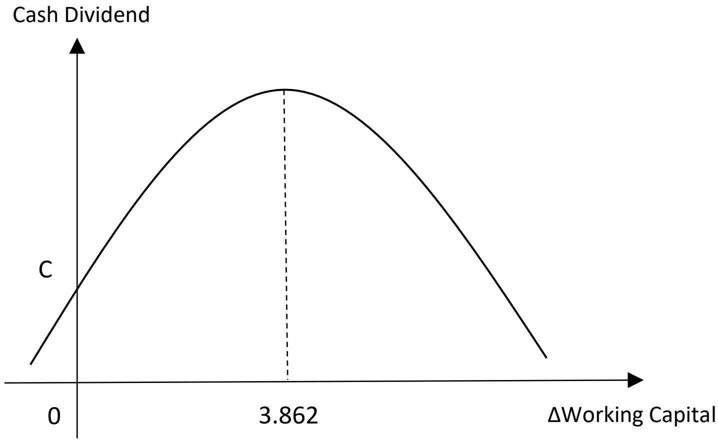
Dependent Variable: CD	Main Market		AIM		
	Coefficients	*p*-value	Coefficients	*p*-value	Sig. of Diff.
CD(t-1)	0.525	0.000***	0.472	0.000***	0.778
	(0.044)		(0.052)		
ΔTP	-1.060	0.011**	-0.268	0.071*	0.823
	(0.656)		(0.704)		
ΔTR	-0.997	0.041**	-0.048	0.435	1.482
	(0.486)		(0.416)		
Div-adj Earnings	-12.963	0.130	-4.406	0.210	1.398
	(5.601)		(2.466)		
Tax	34.758	0.000***	21.328	0.000***	1.793*
	(5.869)		(4.656)		
Inv	-3.650	0.732	-2.239	0.115	0.112
	(10.670)		(6.668)		
Gearing (%)	-0.056	0.000***	-0.051	0.033**	0.325
	(0.010)		(0.012)		
MtB (%)	1.799	0.000***	0.713	0.002***	3.284***
	(0.248)		(0.219)		
Size	1.846	0.001***	4.629	0.014**	2.830***
	(0.536)		(0.825)		
Rep(t-1)	23.898	0.225	-36.465	0.603	1.857*
	(19.651)		(25.882)		
Dum(fs)	-1.184	0.306	0.327	0.964	1.032
	(1.156)		(0.899)		
GDPg (%)	0.239	0.065*	0.171	0.214	0.378
	(0.129)		(0.126)		
Inf (%)	0.344	0.118	-0.679	0.022**	3.119***
	(0.219)		(0.243)		
Constant	-2.060	0.497	-5.359	0.848	0.840
	(3.028)		(2.500)		
m_2		0.195		0.993	
Hansen J-test (*p*-value)		0.254		0.589	
Difference Hansen (*p*-value)		0.383		0.625	
Number of observations		6,777		5,497	

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors (shown in brackets) are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. The significance difference in coefficients uses the absolute value of z test statistics, where $Z = (b_1 - b_2)/\sqrt{SE_{b1}^2 + SE_{b2}^2}$
In equation (3.18), the working capital is split into trade payables and trade receivables.
*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author’s calculations

The third sample split is based on the market nature of the LSE. A firm can list shares on the Main Market (MM) or the Alternative Investment Market (AIM).[54] The MM is designed for large, and more established firms, whilst the AIM is designed primarily for smaller and growing firms to raise the capital they need for expansion.

The results for both the MM versus the AIM are reported in Tables 4.16 and 4.17. Table 4.16 reveals the estimated results, based on equation (3.17). We found that the number of instruments is less than the number of groups for both subsamples. The lag CD coefficient reports a positive and significant sign in the MM and AIM samples. This finding is in line with the overall sample result that the dividend payout has a dynamic relationship. The ΔWC^2 displays a negative coefficient and the ΔWC reports a positive sign. It is significant in the MM sample but not in the AIM sample. These results, again, are consistent with our overall sample results. We argue that the nonlinear impact of working capital on cash dividend is robust in the MM but not in the AIM sample.

Figure 4.8 Main Market: Dividend Payouts and Changes in Working Capital



The figure is based on the estimated results (equation (3.17)) in Table 4.16 when all else is held constant. The estimated equation can be rewritten as: $CD = -0.069\Delta WC^2 + 0.533\Delta WC + Constant$.
Source: Author's calculations

This is because firms listed on the AIM are mostly small and growing firms, while firms listed on the MM are large and world-leading firms. They have higher levels of liquidity and corporate governance compared to firms listed on the AIM.[55] Therefore, they have more working capital with which to alter dividend payouts. The turning point is shown in Figure 4.8.

For firms listed on the MM, when the change of working capital is less than 3.862, it has a positive impact on the dividend payout; when the change in working capital is greater than 3.862, it shows a

[54] Firms listed on the Main Market have to satisfy certain regulatory criteria; provide audited statements for at least three years and be valued at £700,000 or more. Firms with market capitalisation of less than £700,000 are listed on the AIM. For more info: www.londonstockexchange.com/traders-and-brokers/private-investors/private-investors/stock-markets/main-market-and-aim/main-market-and-aim.htm
[55] www.londonstockexchange.com/companies-and-advisors/main-market/companies/companies.htm

negative relationship, holding all else constant. Similarly, the control variable findings are consistent with the full sample. The Dum (fs) is not significant in the MM and AIM samples.

Equation (3.18) results are reported in Table 4.17, for both MM and AIM samples. The lag CD coefficient reports similar results as previous ones (positive and significant). The ΔTP displays a negative coefficient in the MM and AIM samples, and they are significant. The ΔTP coefficient in the MM sample is slightly stronger compared to the AIM sample. An increase in ΔTP (1.06 for MM, 0.94 for AIM) will lead to a decrease in CD (1 unit). This indicates that more current liabilities (trade payables) will not increase dividend payouts because these payables are due within a short period of times and firms would rather use cash to pay their debts than issue it as a dividend. While the ΔTR variable is not significant in the AIM sample, but is in the MM sample, and the coefficient reports a negative sign. This means that more trade receivables will decrease dividend payouts. An increase in trade receivables indicates more transactions made on credit sales, which delays the collection of cash.

Similarly, the Rep (t-1) variable is not significant in either the MM or AIM samples. The Tax, MtB and Size variables are positively correlated with dividend payouts while the Gearing variable shows a negative and significant correlation with dividend payouts. The Dum (fs) is not significant in both the MM and AIM samples. The GDPg is positively significant in the MM sample while the Inf coefficient reports a negative sign in the AIM sample. Most of the results are consistent with previous findings, for example the Tax, Inv, Gearing, MtB, Size, Rep(t-1) and Dum(fs) variables report similar results compared to the overall findings (see also Table 4.8).

Empirical studies have revealed that net working capital is often neglected and that there is room to improve the efficiency of working capital management (such as Buchmann et al. 2008; Ek and Guerin, 2011). Based on Akatas et al.'s (2015) study, we further divided the sample into the firms with sufficient working capital (Above Average WC) and firms with insufficient working capital (Below Average WC). Firstly, we calculated the mean of net working capital for all firms (industry average) and categorised firms with net working capital as higher than the industry average as a positive working capital group and vice versa.

The Above Average WC indicates that firms have sufficient/extra working capital, while Below Average WC group represents firms with working capital levels below average (insufficient working capital). We re-ran our cash dividend models (equations (3.17) and (3.18)). The results are reported in Tables 4.18 and 4.19. We found that the number of instruments is less than the number of groups for both subsamples. The first lag of CD shows a positive and significant relationship in our dependent variable as demonstrated in Table 4.18.

Table 4.18 Subsample (Above Average WC vs. Below Average WC) Results of Equation (3.17)

Dependent Variable: CD	Above Avg. WC		Below Avg. WC		
	Coefficients	*p*-value	Coefficients	*p*-value	Sig. of Diff.
CD(t-1)	0.423	0.000***	0.576	0.000***	2.012**
	(0.049)		(0.058)		
ΔWC^2	-0.093	0.002***	-0.022	0.437	1.759*
	(0.029)		(0.028)		
ΔWC	1.081	0.017**	0.298	0.572	1.127
	(0.450)		(0.528)		
Div-adj Earnings	0.154	0.950	1.892	0.207	0.603
	(2.460)		(1.497)		
Tax	35.728	0.000***	25.456	0.000***	1.306
	(5.983)		(5.106)		
Inv	-1.770	0.856	-0.915	0.918	0.065
	(9.717)		(8.924)		
Gearing (%)	-0.033	0.004***	-0.052	0.000**	1.170
	(0.011)		(0.013)		
MtB (%)	1.406	0.000***	1.205	0.000***	0.531
	(0.258)		(0.277)		
Size	2.581	0.000***	1.909	0.000***	0.889
	(0.585)		(0.478)		
Rep(t-1)	9.816	0.713	-7.151	0.784	0.071
	(26.705)		(26.059)		
Dum(fs)	-0.854	0.377	-0.476	0.558	0.299
	(0.967)		(0.813)		
GDPg (%)	0.190	0.106	0.064	0.549	0.790
	(0.117)		(0.107)		
Inf (%)	-0.046	0.851	-0.244	0.233	0.626
	(0.243)		(0.204)		
Constant	-2.908	0.185	-0.632	0.724	0.803
	(2.193)		(1.793)		
m_2		0.117		0.893	
Hansen J-test (*p*-value)		0.218		0.290	
Difference Hansen (*p*-value)		0.127		0.056*	
Number of Observations		5,979		5,740	

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors (shown in brackets) are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. The significance difference in coefficients uses the absolute value of z test statistics, where $Z = (b_1 - b_2)/\sqrt{SE_{b1}^2 + SE_{b2}^2}$

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author’s calculations

Table 4.19 Subsample (Above Average WC vs. Below Average WC) Results of Equation (3.18)

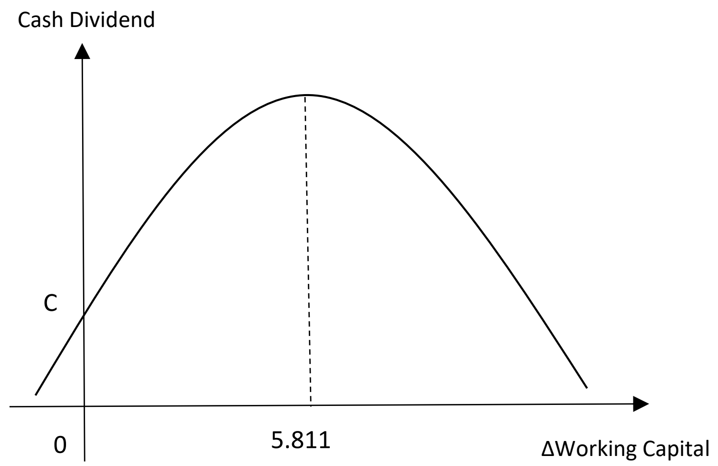
Dependent Variable: CD	Above Avg. WC		Below Avg. WC		
	Coefficients	*p*-value	Coefficients	*p*-value	Sig. of Diff.
CD(t-1)	0.435	0.000***	0.598	0.000***	2.099**
	(0.050)		(0.060)		
ΔTP	-1.076	0.087*	-0.281	0.589	0.976
	(0.627)		(0.520)		
ΔTR	-0.037	0.094*	-0.865	0.220	1.370
	(0.033)		(0.377)		
Div-adj Earnings	-1.746	0.650	0.524	0.777	0.533
	(3.842)		(1.846)		
Tax	35.636	0.000***	27.304	0.000***	0.963
	(6.624)		(5.566)		
Inv	-1.657	0.884	1.784	0.867	0.221
	(11.364)		(10.644)		
Gearing (%)	-0.033	0.006***	-0.042	0.000***	0.542
	(0.012)		(0.011)		
MtB (%)	1.266	0.000***	1.002	0.000***	0.764
	(0.239)		(0.249)		
Size	2.493	0.000***	2.45	0.000***	0.054
	(0.649)		(0.532)		
Rep(t-1)	19.952	0.453	-6.046	0.834	0.664
	(26.598)		(28.759)		
Dum(fs)	-0.987	0.430	-0.942	0.310	0.029
	(1.249)		(0.926)		
GDPg (%)	0.252	0.043*	-0.011	0.932	1.470
	(0.124)		(0.129)		
Inf (%)	-0.127	0.631	-0.119	0.644	0.022
	(0.264)		(0.257)		
Constant	-2.469	0.358	-3.353	0.112	0.259
	(2.686)		(2.110)		
m_2		0.318		0.574	
Hansen J-test (*p*-value)		0.169		0.388	
Difference Hansen (*p*-value)		0.210		0.763	
Number of Observations		5,221		4,874	

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors (shown in brackets) are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. The significance difference in coefficients uses the absolute value of z test statistics, where $Z = (b_1 - b_2)/\sqrt{SE_{b1}^2 + SE_{b2}^2}$
In equation (3.18), working capital is split into trade payables and trade receivables.
*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

This indicates that dividend payout has a dynamic relationship. ΔWC shows a positive sign while ΔWC^2 reports a negative figure in the regression results, reported in the Above Average WC group. We argue that there is a concave relationship between change in working capital and dividend payout in our Above Average WC group. However, the ΔWC^2 and ΔWC coefficients are not significant in the Below Average WC group. The findings suggest that firms use their sufficient/extra working capital to adjust dividend payouts, while for firms with low working capital, this effect is not significant. This may be the result of firms' specific working capital management policies. For the Above Average WC group, firms could make good use of excess working capital for other financial purposes (such as adjusting their dividend payouts).

In contrast, for the Below Average WC group adjusting their dividend payout via net working capital is not recommended, as they already have low levels of working capital. This would increase the volatility of working capital and may lead to liquidity risks. Similarly, we also calculated the turning point for the Above Average WC group and sketched the concave relation in Figure 4.9.

Figure 4.9 Above Average WC: Dividend Payouts and Changes in Working Capital



The figure is based on the estimated results (equation (3.17)) in Table 4.18 when all else is held constant. The estimated equation can be rewritten as: $CD = -0.093\Delta WC^2 + 1.081\Delta WC + Constant$.
Source: Author's calculations

As observed, for the Above Average WC group, when the change in working capital is less than 5.811, it shows a positive relationship; when the change in working capital is larger than 5.811, the relationship is negative. Similarly, the Div-adj Earnings, Inv and Rep (t-1) variables are not significant in either the Above Average WC or Below Average WC groups. The Tax, Gearing, MtB, and Size coefficients are consistent with previous findings. Dum (fs), GDPg and Inf are not significant in the subsamples.

After splitting changes in working capital into trade payables and trade receivables, we re-ran equation (3.18) for the Above and Below Average WC groups. The results are shown in Table 4.19. The lag dividend payout coefficient is positive and significant in both subsamples. Thus, the dynamic relationship is consistent with previous findings. The ΔTP and ΔTR coefficients are negative in the subsample results. They are significant in the Above Average WC group, but not in the Below Average WC group.

This indicates that a 1.0758 unit increase in change in trade payables would lead to 1 unit decrease in dividend payout; while a 0.0366 unit increase in change in trade receivables results in a 1 unit decline in dividend payouts. More trade receivables indicate that more transactions are made on credit sales (without being paid); as a result, the firms have less available cash to issue a cash dividend. An increase in trade payables suggests that current liabilities increase and firms are more concerned with paying off short-term debts rather than issuing a dividend.

The Div-adj Earnings, Inv, Rep (t-1), Dum(fs) and Inf coefficients are not significant in the subsamples. The Tax, Gearing, MtB and Size coefficients report consistent results compared to previous findings. The GDPg variable is positive and significant in the Above Average WC group.

The final sample split is based on volatility in sales of firms. We calculated the volatility in sales mean and split the overall sample into high volatility in sales (greater than the mean) and low volatility in sales (smaller than the mean). Instability in sales indicates earnings volatility/performance. We re-examined the model (equations (3.17) and (3.18)). The results are reported in Tables 4.20 and 4.21. Table 4.20 reports the estimated results of high and low volatility in sales based on equation (3.17).

We found that the number of instruments is less than the number of groups, for both subsamples. The lag CD coefficient reports a positive and significant sign in the subsamples. This finding is similar to the overall sample result that the dividend payout has a dynamic relationship. The ΔWC^2 displays a negative coefficient and ΔWC reports a positive sign. They are significant in the high volatility sales sample. However, they are not significant in the low volatility sales group. This indicates that the concave relationship between the working capital and dividend payout only holds for the high volatility sales sample.

Next, we calculated the turning point of change in working capital and plotted the relationship in Figure 4.10. For the high volatility sales group, at low levels of working capital, an increase in working capital increases the dividend payouts with a maximum effect occurring at 7.214 per cent; after the turning point of 7.214, an increase in working capital leads to a decline in dividend payouts.

The Div-adj Earnings, Inv, Rep (t-1), Dum (fs) and GDPg coefficients are not significant in the subsamples. The Tax, Gearing, MtB, and Size coefficients report similar results compared to the overall findings (see Table 4.8), except for the Gearing in low volatility in sales, which is not significant.

Table 4.20 Subsample (High ΔSales vs. Low ΔSales) Results of Equation (3.17)

Dependent Variable: CD	High Volatility in Sales		Low Volatility in Sales		
	Coefficients	*p*-value	Coefficients	*p*-value	Sig. of Diff.
CD(t-1)	0.484	0.000***	0.515	0.000***	0.287
	(0.082)		(0.068)		
ΔWC^2	-0.063	0.012**	-0.019	0.485	1.207
	(0.025)		(0.027)		
ΔWC	0.909	0.047**	0.076	0.873	1.267
	(0.456)		(0.474)		
Div-adj Earnings	0.395	0.894	2.542	0.208	0.601
	(2.951)		(2.016)		
Tax	27.914	0.001***	32.032	0.000***	0.410
	(8.046)		(6.026)		
Inv	11.309	0.425	13.001	0.135	0.102
	(14.159)		(8.701)		
Gearing (%)	-0.022	0.014**	-0.016	0.232	0.414
	(0.009)		(0.013)		
MtB (%)	0.831	0.023**	0.775	0.005***	0.120
	(0.365)		(0.279)		
Size	1.819	0.011**	1.697	0.002***	0.137
	(0.715)		(0.540)		
Rep(t-1)	72.704	0.213	37.112	0.234	0.539
	(58.283)		(31.151)		
Dum(fs)	-2.032	0.254	-2.140	0.360	0.053
	(1.781)		(1.020)		
GDPg (%)	-0.010	0.960	0.135	0.416	0.563
	(0.196)		(0.165)		
Inf (%)	-0.775	0.033**	-0.638	0.065*	0.273
	(0.363)		(0.345)		
Constant	2.653	0.359	-1.540	0.491	1.148
	(2.891)		(2.233)		
m_2		0.393		0.869	
Hansen J-test (*p*-value)		0.807		0.723	
Diff-Hansen (*p*-value)		0.628		0.976	
Number of Observations		2,780		2,964	

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors (shown in brackets) are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. The significance difference in coefficients uses the absolute value of z test statistics, where $Z = (b_1 - b_2)/\sqrt{SE_{b1}^2 + SE_{b2}^2}$

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations

Table 4.21 Subsample (High ΔSales vs. Low ΔSales) Results of Equation (3.18)

Dependent Variable: CD	High Volatility in Sales		Low Volatility in Sales		
	Coefficients	*p*-value	Coefficients	*p*-value	Sig. of Diff.
CD(t-1)	0.532	0.000***	0.577	0.000***	0.438
	(0.080)		(0.064)		
ΔTP	-1.597	0.027**	-0.213	0.691	1.545
	(0.719)		(0.534)		
ΔTR	-0.311	0.036**	-0.539	0.174	0.504
	(0.340)		(0.301)		
Div-adj Earnings	0.479	0.887	3.300	0.148	0.694
	(3.364)		(2.280)		
Tax	29.454	0.000***	30.955	0.000***	0.144
	(8.207)		(6.401)		
Inv	15.963	0.321	11.198	0.204	0.260
	(16.076)		(8.810)		
Gearing (%)	-0.023	0.037**	-0.023	0.064**	0.006
	(0.011)		(0.013)		
MtB (%)	0.618	0.072*	0.788	0.002***	0.401
	(0.343)		(0.248)		
Size	1.578	0.039**	1.404	0.008***	0.187
	(0.764)		(0.530)		
Rep(t-1)	64.794	0.276	67.660	0.200	0.043
	(59.433)		(29.103)		
Dum(fs)	-2.264	0.238	-2.589	0.204	0.146
	(1.916)		(1.142)		
GDPg (%)	-0.048	0.825	0.208	0.281	0.886
	(0.214)		(0.192)		
Inf (%)	-0.803	0.064*	0.874	0.180	2.949***
	(0.434)		(0.369)		
Constant	3.809	0.199	-1.859	0.376	1.562
	(2.963)		(2.097)		
m_2		0.996		0.972	
Hansen J-test (*p*-value)		0.236		0.231	
Diff-Hansen (*p*-value)		0.397		0.385	
Number of Observations		2,416		2,556	

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors (shown in brackets) are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. The significance difference in coefficients uses the absolute value of z test statistics, where $Z = (b_1 - b_2)/\sqrt{SE_{b1}^2 + SE_{b2}^2}$

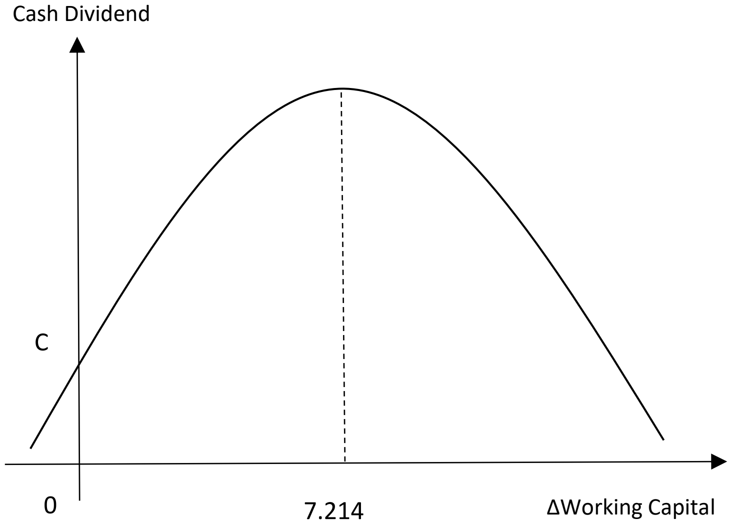
In equation (3.18), working capital is split into trade payables and trade receivables.

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations

The Inf coefficient displays a negative and significant sign in the subsamples, suggesting that the dividend payouts may increase when the inflation rate is low.

Figure 4.10 High Volatility in Sales: Dividend Payouts and Changes in Working Capital



The figure is based on the estimated results (equation (3.17)) in Table 4.20 when all else is held constant. The estimated equation can be rewritten as: $CD = -0.063\Delta WC^2 + 0.909\Delta WC + Constant$.
Source: Author's calculations

After splitting working capital into trade payables and trade receivables, we re-ran the model (equation (3.18)) and found that the lag CD coefficient is positive and significant in the subsamples. This is in line with the overall sample findings. Both ΔTP and ΔTR show a negative and significant relationship to CD in the high volatility sales group. Therefore, for this group, a trade payable increase of 1.596 would decrease CD by 1 unit; a trade receivable increase of 0.3105 will result in a decrease in CD by 1 unit. However, ΔTP and ΔTR coefficients do not report any significant signs in the low volatility sales group.

The Div-adj Earnings, Dum (fs) coefficients are not significant in both subsamples. The results suggest that the dividend-adjusted earnings and external financial shocks do not significantly affect dividend payouts. Consistent results are observed for Tax, Gearing, MtB, Rep (t-1), Size, Inv, and GDPg coefficients.

4.3.4 Stock Dividends

Since stock dividend information is not provided in the *Bloomberg* database directly, we used the stock dividend rate based on a straightforward and rough calculation.[56] After the calculations, the stock

[56] Stock dividend rate equals the total payout minus any cash dividends minus the stock repurchases and divided by the total payout.

dividend rate yielded a tiny sample (164 observations) for the period of 2012 to 2015. We explained the rationale for choosing the estimated technique (it varies from fixed/random effect regression and GMM) in Chapter 3. These included the benefits of using system GMM for controlling endogeneity and heteroscedasticity issues and improvements in our stock dividend models. We also obtained consistent and robust results using the system GMM in our overall sample.

According to Roodman (2009), the difference or system GMM can be adopted when panel data meets some specific assumptions. One assumption states that:

"The number of time periods of available data, *T*, may be small. (The panel is "small *T*, large *N*".)" --- (Roodman, 2009, pp. 100)

The number of observations we obtained is 163, and the number of groups is 82, which means only 82 firms issued stock dividends in our overall sample. The "N" is 82 and "T" is 25 in our stock dividend sample. This does not fit the GMM assumptions.

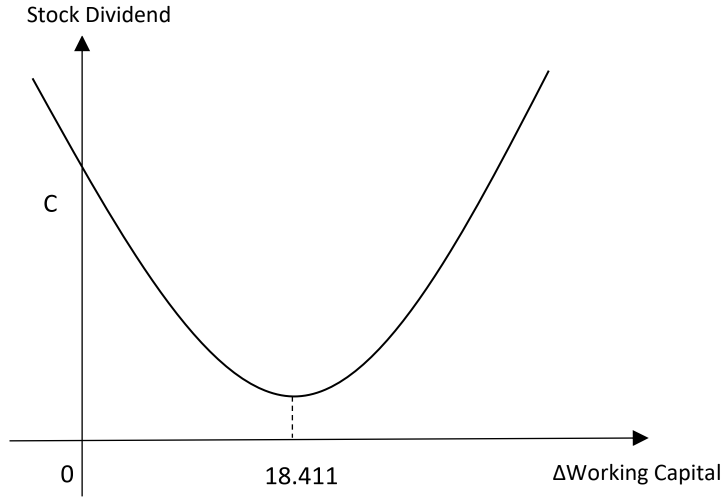
When using the GMM estimate method, the number of groups must be greater than the number of instruments in order to obtain robust results (Roodman, 2009). The small stock dividend sample results in a limited number of groups. However, the GMM instrument variable does not change and would create the same number of instruments as a cash dividend. Therefore, it is likely that we would obtain a number of groups smaller than the number of instruments. The interpretation based on these results is spurious. Therefore, the GMM estimate is not suitable for the stock dividend sample. We adopted the random/fixed effect regression test for our stock dividend sample.

The Hausman test reports a chi-square of 43.41 and a p-value of 0.000. Thus, we rejected the null hypothesis that the difference between random and fixed coefficients is not systematic. In other words, a fixed effect specification is appropriate for individual-level effects in our stock dividend model (Hausman, 1978). The fixed effect regression results show an R-squared of 44.56% and F-statistics of 30.85 in our stock dividend model (equation (3.19)).

According to the results, the SD (t-1) has a significant impact on the SD, which indicates that the stock dividend is also dynamic. However, the coefficient is negative. This contradicts our cash dividend model (equation (3.17)) findings. If a firm issues a stock dividend in the previous year, the firm has a higher propensity to cut off or not issue any stock dividend in the current year. The ΔWC^2 coefficient reports a positive and significant sign, and its square term shows a negative and significant value. Therefore, we argue that working capital has a nonlinear effect on stock dividends as well. However, the results are opposite to what we observed in the cash dividend model (equation (3.17)). In Table 4.22, the ΔWC variable is significant, but it shows a convex relationship with the SD. This implies that low volatility in working capital will decrease the stock dividend and high volatility in working capital will increase the stock dividend. Similarly, we can calculate the ΔWC turning point for the stock dividend model.

We plotted Figure 4.11 based on the results in Table 4.22. Holding all else constant, we found that the ΔWC turning point equals 18.411. Therefore, when ΔWC is less than 18.411, it has a negative relationship with the stock dividend; when ΔWC is larger than 18.411, it has a positive impact on the stock dividend.

Figure 4.11 Stock Dividends and Changes in Working Capital



The graph is based on the estimated results (equation (3.19)) in Table 4.22 when all else is held constant. The estimated equation can be rewritten as: $SD = 0.017\Delta WC^2 - 0.626\Delta WC + Constant$
Source: Author's calculations

The Size coefficients positive and significant to the SD. This shows that bigger firms issue more stock dividends than smaller firms. The EPS coefficient is negatively correlated with the SD (see Wei and Xiao, 2009). A lower EPS indicates that the firm is not profitable and may have difficulty issuing cash dividends; therefore, it may choose to issue stock dividends instead. A higher EPS shows that the firm's profits are rising, and would have a higher propensity to issue cash dividends rather than stock dividends. Besides, we find that the Inf coefficient exhibits a positive relationship with the SD. Firms have a low propensity to issue cash dividends when macroeconomic conditions are unstable. In such scenarios, firms may seek stock dividends as alternatives. The ROE, Tax, Gearing, and MtB, Rep (t-1) and Dum (fs) coefficients are not significant in our stock dividend model. This suggests that the SD is not affected by these financial ratios.

Following the same procedure, we split working capital into trade receivables and trade payables to further test the working capital variable in our stock dividend model. The estimated results are reported in Table 4.23. The R-squared is 40.35%, and the *F*-statistics is 40.35.

Table 4.22 Stock Dividend Results of Equation (3.19)

Dependent Variable: SD	Coefficients	*t*-statistics	*p*-value
SD(t-1)	-0.288	-1.77	0.081*
	(0.163)		
ΔWC^2	0.017	2.54	0.013***
	(0.007)		
ΔWC	-0.626	-2.02	0.047**
	(0.310)		
ROE	-0.057	-0.36	0.717
	(0.156)		
EPS	-6.508	-1.71	0.091**
	(3.802)		
Tax	-25.957	-1.02	0.312
	(25.529)		
Size	11.163	1.62	0.100*
	(6.880)		
Gearing (%)	-0.029	-0.82	0.416
	(0.035)		
MtB (%)	0.169	1.25	0.215
	(0.135)		
Rep(t-1)	11.852	0.26	0.793
	(44.979)		
Dum(fs)	0.873	0.18	0.861
	(4.984)		
GDPg (%)	3.713	0.96	0.341
	(3.876)		
Inf (%)	1.337	1.85	0.067**
	(0.721)		
Constant	-69.706	-1.48	0.144
	(47.230)		
F-Statistics (*p*-value)			30.85***
R-squared			44.56%
Number of Observations			163

Dynamic stock dividend (SD) regression is estimated by Fixed-Effects Regression. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity.

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author’s calculations

Table 4.23 Stock Dividend Results of Equation (3.20)

Dependent variable: SD	Coefficients	*t*-statistics	*p*-value
SD(t-1)	-0.269	-1.89	0.062*
	(0.142)		
ΔTP	-0.738	-0.57	0.571
	(1.296)		
ΔTR	-0.090	-0.07	0.947
	(1.355)		
ROE	-0.071	-0.44	0.662
	(0.162)		
EPS	-6.914	-1.83	0.071*
	(3.779)		
Tax	-24.598	-0.94	0.349
	(26.094)		
Size	11.936	1.59	0.10*
	(7.506)		
Gearing (%)	-0.029	-0.9	0.372
	(0.032)		
MtB (%)	0.210	1.61	0.091*
	(0.131)		
Rep(t-1)	15.992	0.33	0.741
	(48.297)		
Dum(fs)	0.164	0.03	0.975
	(5.210)		
GDPg (%)	3.738	0.95	0.346
	(3.944)		
Inf (%)	1.492	1.72	0.09*
	(0.869)		
Constant	-73.925	-1.48	0.142
	(49.835)		
F-Statistics (*p*-value)			40.35***
R-squared			41.48%
Number of Observations			161

Dynamic stock dividend (SD) regression is estimated by Fixed-Effects Regression. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity.

In equation (3.20), working capital is split into trade payables and trade receivables.

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations

According to Table 4.23, the SD (t-1) coefficient reports a significant and negative sign. Therefore, we can argue that firms' current dividend payout is significantly affected by the past year's dividend payout policy. More specifically, a previous cash dividend has a positive impact on the current cash dividend payout, while a previous stock dividend has a negative correlation with the current stock dividend payout. Thus, the concave (cash dividend) and convex (stock dividend) relationship show that working capital has a very significant, but opposite, nonlinear impact on cash and stock dividend payouts, respectively. Thus, under dividend payout via working capital, we conclude that cash dividends and stock dividends are substitutes. The EPS, Size and Inf rate coefficients display consistent results (see Table 4.22). Further, we find that MtB is positively correlated with the SD. Unfortunately, the ΔTP and ΔTR coefficients are insignificant after the split.

Based on the results, one can conclude that the determinants of stock dividends are very different compared to those of cash dividends. The cash dividend model presents better results than the stock dividend model. One possible reason is that the system GMM has several benefits over the fixed effect regression, such as controlling for endogeneity, and serial correlation issues. Another possible reason is that the stock dividend sample is smaller than the cash dividend sample.

4.4 Robustness Test

In this section, we provide the robustness test results for our estimated dividend models. Based on the research objectives in Chapter 1, we designed the third research objective (testing ΔTrade Receivables and ΔTrade Payables) in accordance with the second research objective (testing ΔWorking Capital). Trade receivables and trade payables are two essential elements in working capital, and therefore, ΔTrade Payables and ΔTrade Receivables can be viewed as proxies for ΔWorking Capital. We split working capital into two components and further tested their significance. The results were found to be consistent. In the empirical analysis, we found that the change in the working capital (ΔWorking Capital) shows a concave relationship with cash dividend payout. We observed a linear relationship between the change in working capital and dividend payout in the 1,048 firms with a relatively low change in working capital, and a concave relationship in the 527 firms that have a relatively high change in working capital. Moreover, the concave relationship between change in working capital and dividend payout is significant in our subsamples. The results show consistency regarding the correlation between dividend and working capital compared to our main findings.

Further, we found that the change in trade payables (ΔTrade Payables) is negatively correlated with cash dividend payout and the change in trade receivables (ΔTrade Receivables) has a negative impact on cash dividend payouts, in some of our subsamples. The significant results satisfy all the tests (serial correlation, J-test, Hansen test, validation of instruments, and the number of group and instruments) and thus our estimated results are robust.

Whilst the stock dividend sample is relatively small and not suitable for splitting into subsamples and re-running the stock dividend models (equations (3.19) and (3.20)), we use the level of working capital as a proxy for change in working capital and obtain similar results.[57] Therefore, we argue that working capital has a nonlinear impact on the stock dividend payout. This nonlinear effect (convex) is opposite to the cash dividend payout.

4.5 Summary

The result shows that the cash dividend is positively correlated with its first lag (see also Lintner, 1956) while the stock dividend is negatively correlated with its first lag. Therefore, we conclude that dividend payout has a dynamic relationship and that firms' current dividend payout policies are significantly affected by previous dividend payouts. In other words, if a firm paid a cash dividend last year, it is likely that the firm will pay a cash dividend this year. If a firm issued a stock dividend in the previous year, then it expected that the firm will not issue or decrease the stock dividend for the current year. We found that the ΔWC^2 and ΔWC coefficients report negative and positive signs, respectively. This indicates that the change in working capital has a significant impact on the cash dividend payout and that this relationship is nonlinear (concave). This concave relationship is confirmed in our subsample results (see Table 4.24).

For the overall sample, when the change in working capital is less than 5.426, it has a positive impact on the cash dividend payout and when the change in working capital is greater than 5.426, it has a negative relationship. Further, the turning point (5.426 in ΔWC) means that the overall sample can be divided into two groups: 1,048 firms in the "$\Delta WC < 5.426$" group versus 527 firms in the "$\Delta WC \geq 5.426$" group. We also observed that only 527 firms shift between these two groups from period to period. The results suggest that the positive relationships between net working capital and the dividend payout are robust for most of the firms. However, the concave correlation between net working capital and the dividend payout is significant only for firms with higher changes in working

[57] Net working capital (scaled down by total asset), as a proxy of change in working capital, is used in both cash and stock dividend models. We obtained consistent results (a concave relationship in cash dividends and a convex relationship in stock dividends). The original outputs (including the Stata commands) are shown in the Appendices.

capital. For firms in the positive group, we found that working capital has a positive (linear) impact on the dividend payout, holding all else constant. For firms in the positive and negative group, working capital has a concave effect on the dividend payouts.

Table 4.24 Summary of Key Findings: Cash Dividend Models

	Overall Sample	+ and − group	Non-financial	Mature	MM	Pos WC	High v in Sales
CD(t-1)	**+**	**+**	**+**	**+**	**+**	**+**	**+**
Div-adj Earn	×	×	×	×	×	×	×
ΔWC^2	**–**	**–**	-	**–**	**–**	**–**	**–**
ΔWC	**+**	**+**	**+**	×	**+**	**+**	**+**
ΔTP	**–**	**n.a.**	-	**–**	**–**	**–**	**–**
ΔTR	×	**n.a.**	-	**–**	**–**	**–**	**–**
Rep(t-1)	×	×	×	×	×	×	×
Dum (fs)	×	×	×	**–**	×	×	×

Note: "+" represents significant and positive relationships; "–"shows significant and negative relationships, and "×" indicates that the relationship is not significant. For more details, see Tables 4.8 to 4.23 in sections 4.3.1, 4.3.2 and 4.3.3.
Source: Author's calculations

Similarly, we calculated turning points for the changes in working capital. They are 9.387, 2.21, 3.848, 5.841 and 7.10% for the subsample of non-financial firms, mature firms, firms listed on the MM, firms with above average WC and firms with high volatility in sales, respectively. One should understand that the turning point of change in working capital is an estimated figure and it changes in our subsamples' results. Similarly, the concave relationship between the change in working capital and the cash dividend payout is based on a prerequisite, which is relatively high in a change in working capital. Based on our data, these relatively high changes in working capital are only found in some firms on the LSE. Nevertheless, the turning point (of ΔWC) sets a rough benchmark/target (when all else is held constant) for those firms either in the positive group or the negative group. It also helps firms to understand that how the working capital may affect dividend payouts differently.

We also found that this nonlinear effect of working capital is not significant in the subsample of financial firms, young firms, AIM, negative working capital and low volatility in sales. The ΔTP coefficient reports a negative sign, while the ΔTR is not significant in our overall sample. In our mature firms, MM, above average WC and high volatility in sales subsamples, we find that both ΔTP and ΔTR are negatively correlated with cash dividend payout. However, the results are not significant in the young firms, AIM, negative working capital and low volatility in sales subsamples. As shown in Table

4.24, the lag of dividend payout coefficient is positive and significantly correlated with the current dividend payout in the overall sample and in the subsamples. The results further confirm that the cash dividend payout has a dynamic relationship. The Div-adj Earnings coefficient is not significant in any of the samples. Similarly, we found that the Rep (t-1) variable is not significant in any samples, which suggest that the substitution hypothesis between dividend payout and stock repurchase does not hold in our case. This finding contradicts Andres et al. (2015) who argues that dividends and repurchases are perfect substitutes. We find that the Dum (fs) is negatively correlated with cash dividend in mature firms, but that it is not significant in the overall sample nor the rest of the subsamples. To conclude, we argue that the Div-adj Earnings and Dum (fs) variables are not significant in determining dividend payout.

Most of the control variables report consistent results. The Tax, MtB, and Size variables are positively correlated with the cash dividend, and the Gearing coefficient reports a negative sign. The Inv and Rep (t-1) coefficients are not significant.[58] For macroeconomic variables, the results are mixed in the overall sample and subsamples. The GDPg shows a positive relation in the overall sample, mature firms group, firms listed on the Main Market, and firms with above average WC, but it is not significant in the rest of the subsamples. Similarly, the Inf rate is negatively correlated with cash dividends in the AIM, high volatility in sales and low volatility in sales samples, but we could not find significant results in the overall sample and other subsamples. We conclude that GDP growth has a positive impact on firms' cash dividend payout, and that the inflation rate is not significant.

Further, we detected a convex relationship between changes in working capital and stock dividend payouts. The SD (t-1) coefficient reports a negative sign. EPS is negatively correlated with the SD. However, the Size and Inf variables have a positive impact on the SD. We found that the Rep (t-1) is insignificant in the stock dividend models.

The insignificant relationship between stock repurchase and dividend (both cash and stock dividend) suggests that they are not substitutes. Firms are flexible in deciding their dividend payout policies. Div-adj Earnings is insignificant in the cash dividend models. This indicates that current earnings are not a predominant factor in determining a firm's dividend policy.

The concave and convex relationships between working capital and dividends show that a cash dividend is very different from a stock dividend. Based on the relationship between working capital and dividend payout, we argue that cash dividends and stock dividends are substitutes. The results from the stock dividend models indicate that the stock dividend determinants are quite different

[58] More specific results can be found in Tables 4.8 to 4.23.

compared to the cash dividend. According to our descriptive analysis and the sample size in cash and stock dividends, dividends (especially cash dividends) remain the dominant form of payout of firms listed on the LSE despite stock repurchase increases over the period.

The total dividend payout shows an upward trend throughout the study period. We observed significant decreases in dividend payouts in 2008 and 2012. We also found that the 2008 global financial crisis influenced firms' financial performances (such as earnings, working capital, and MtB). According to our empirical findings, the Dum (fs) is not significant, which means that the external financial shocks did not have a significant impact on firms' dividend payouts.

Chapter 5 Conclusions

5.1 Introduction

Dividend payout, as a return for shareholders, has been extensively examined in prior literature. Developed by Modigliani and Miller (1961), the dividend irrelevance theory argues that dividend policy is not affected by share price, nor by the cost of capital. However, some studies (Stiglitz, 1974; Fairchild et al., 2014) have criticised this theory, due to its underlying assumptions. Owing to the friction between the practical and theoretical aspects of the dividend irrelevance model, the assumptions (perfect capital market, no taxes, no risk and fixed investment policy) do not hold true, most of the time.

Determinants of dividend payouts can be summarised by, but not limited to, the following theories: dividend signalling theory (Darling, 1957; Dhanahi, 2005; Howatt et al., 2009), free cash flow theory (Jensen, 1986), life-cycle theory (Muller, 1972; Jensen, 1986), bird-in-hand theory (Brigham and Ehrhardt, 2008), agency theory (Jensen, 1976), and catering theory (Baker and Wurgler, 2004). However, the empirical results based on these theories are far from conclusive, which makes dividend payouts one of the most controversial issues in corporate finance. Black (1976) called this the "dividend puzzle".

By modifying the current earnings measurements, this study has increased the effectiveness of the research model, in particular, by improving the accuracy of the estimated coefficient of current earnings. This study has also bridged the gap between working capital and firm dividend payout. Due to the significance of working capital (on firm performance), as well as its high liquidity, we argue that the working capital may have an impact on the dividend payout. This study, therefore, has examined the dividend payouts of firms listed on the LSE, from 1991 to 2015, using the system GMM estimator to address endogeneity issues. We have shown that working capital has a significant impact on dividend payout, and that the relationship is nonlinear. This nonlinear relationship is confirmed by our overall sample and subsample results.

This chapter is structured as follows: section 5.2 summarises the current study's objectives and major findings. Section 5.3 presents an outline of policy implications based on the empirical findings. The contributions of the study are discussed in section 5.4, while section 5.5 provides the study's limitations and directions for future research.

5.2 Summary of the Findings by Research Objective

5.2.1 Research Objective One

The aim of research objective one was to re-investigate the relationship between current earnings and dividend payout in the UK stock market. We re-measured the earnings variable (denoted as dividend-adjusted earnings) because of the unsolved issue between earnings and dividend variables in previous studies.

In Table 4.2, we have shown that firms which issue large dividends have greater net earnings, and that firms with the lower earnings issued the smallest dividends. For example, telecommunications and Oil and Gas firms the first and second largest dividend payers, and both of these sectors have substantial earnings, while Technology firms with the lowest cumulated earnings issue the smallest dividend payouts (Fama and French, 2001). It appears that earnings have a positive effect on the dividend payout. However, our empirical evidence (see Table 4.8) shows that there is no correlation between the (dividend-adjusted) earnings and dividend payout, which suggests that the current earnings are not a predominant factor in explaining dividend payout (Farsio et al., 2004). For comparison purposes, we included the results of normal earnings (unadjusted) in Table 4.8. The results show the normal earnings have a positive and significant impact on dividend payouts. The different findings of unadjusted and dividend adjusted earnings highlight the issue (between current earnings and dividend payout) we criticised in Chapter 2 and confirms that the current earnings are not significant in determining dividend payouts.

Further, we found that the coefficient of earnings is not significant in any of the subsamples. The results are consistent with the overall sample's findings. Therefore, the current (dividend-adjusted) earning cannot affect dividend payouts. One possible reason is that dividend policy is concerned with how much of its earnings a firm will issue to its shareholders. However, earnings only indicate how much a firm should have earned, not the cash that a firm actually has in any given accounting period. Generally, there is a difference between the proposed dividend payout and the actual amount distributable to shareholders. Therefore, the insignificant results between current earnings and dividend are robust.

5.2.2 Research Objective Two

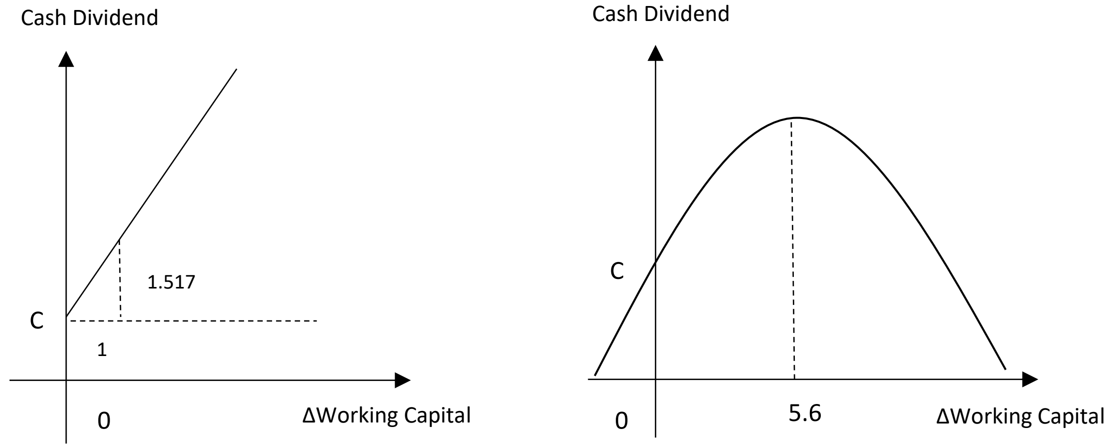
Research objective two's primary aim was to examine the correlation between working capital and dividend payouts in the context of the UK stock market. In the descriptive analysis, Figure 4.3 illustrates the trend of dividend payouts regarding changes in working capital. We have observed that the dividend payout and change in working capital share some similar movements, but not for the whole study sample period.

Based on previous literature, which shows a nonlinear relationship between working capital and firm performance, we included the change in working capital squared and change in working capital in the regressions. The empirical evidence revealed that the coefficient of change in working capital squared and change in the working capital report -0.088 and 0.955, respectively. The joint results reflect a concave relationship between the change in working capital and the cash dividend payout, when all else is held constant. Based on the results, the estimated equation (3.17) can be rewritten as (when all else is held constant):

$$CD_{it} = -0.088\Delta WC_{it}{}^{2} + 0.955\Delta WC_{it} + Constant$$

The turning point of change in working capital is 5.426. In other words, when the change in working capital is less than 5.426, it has a positive impact on cash dividend payouts. However, when the change in working capital is greater than 5.426, it has a negative impact on cash dividend payouts.

Figure 5.1 Dividend Payout and Change in Working Capital: Subsamples



(a) Positive Group (1,048 firms) (b) Positive and Negative Group (527 firms)

Source: Author’s calculations

Further, we split the sample into two subsamples, according to this turning point of change in working capital (5.426). Equation (3.17) is re-estimated in both of the subsamples. We found that the concave relationship is significant in the positive and negative group, and the turning point of change in working capital increases slightly. This finding is consistent with our overall sample results. However, the concave relationship is not significant in the positive group, which implies that a linear relationship may be a better explanation for the positive group. We made a minor change to equation (3.17) by excluding the change in working capital squared variable and re-ran the regression for the positive group, and the results were similar to our expectation that the change in working capital has a linear (positive) correlation to the cash dividend payout. The relationship between change in working capital and the dividend payout of the subsamples are shown in Figure 5.1.

Therefore, we conclude that the change in working capital has a significant impact on the dividend payout in the overall sample and that the relationship is nonlinear (concave). This concave relationship is a mixture of a positive linear relationship for 1,048 firms in the positive group, and a concave relationship in 527 firms located in the positive and negative group. Apart from the relationship between working capital variables and dividend payout, we also found similar results for the control variables. All of the control variable coefficients (in both subsamples) show high consistency compared to the overall sample results (see Tables 4.8 and 4.11).

Finally, we divided the overall sample via different rationales: financial firms versus non-financial firms; young versus mature groups; firms listed on the Main Market (MM) versus the Alternative Investment Market (AIM); firms with sufficient working capital (Above Average WC) versus firms with insufficient working capital (Below Average WC); high volatility in sales group versus low volatility in sales group. These analyses were conducted in order to avoid statistical coincidences and obtain robust results.

In the mature subsample, we found a concave relationship between the change in working capital and dividend payout, but this correlation was not as strong as in the overall sample. We found a strong concave relationship between the change in working capital and dividend payout in the subsamples of non-financial firms, mature, Main Market, Above Average WC, and high volatility in sales (see Table 5.1).

Based on the estimated results, we calculated the turning point of change in working capital in each subsample. One can infer that the turning points are slightly different from 5.426 in the overall sample results, as the different subsamples have a different number of observations. Nevertheless, the main conclusion is similar; that is, working capital is strongly correlated with cash dividend payouts. The results show that the working capital variable is not significant in financial firms, young, AIM, Below Average WC, and low volatility in sales subsamples.

Table 5.1 Subsamples Analysis: Key Findings on Working Capital

Dependent Variable: CD	Non-financial Firms Sample	Mature Sample	Main Market Sample	Above Avg. WC Sample	High Volatility in Sales Sample
ΔWorking Capital	strong concave	weak concave	strong concave	strong concave	strong concave

The specific results are reported in Tables 4.12, 4.14, 4.16, 4.18 and 4.20, respectively.
Source: Author’s Calculation

The results suggest that change in working capital is a significant factor in dividend payouts, and for a different group of firms, the relationship is different. The subsample analysis also reveals that firms located in the positive and negative group are most likely firms listed on the main market board on the LSE and have sufficient working capital and higher volatility in their sales revenue.

5.2.3 Research Objective Three

Research objective three sought to discover the relationship between trade receivables and dividend payouts, as well as the correlation between trade payables and dividend payouts in the UK stock market. This research objective was based on research objective 2 which tested the correlation between working capital and dividend payouts.

Figure 4.2 shows that both the levels of trade receivables and trade payables are positive, and they exhibit a similar increasing trend over the study period. When compared to the dividend payout in Figure (4.1), trade receivables and trade payables exhibit a positive impact on the dividend payout, since these variables indicate an increasing trend. However, the empirical results demonstrate quite the opposite. The overall sample results show that both changes in trade payables and trade receivables report a negative coefficient and that the change in the trade receivables variable is not significant. This suggests that an increase in trade payables would decrease dividend payouts. This is because the current liabilities would increase burdens on the dividend payout. This also indicates that firms' are more concerned with clearing their short-term debts, than paying any dividends when the change in the trade payables variable is positive.

Table 5.2 Subsamples Analysis: Key Findings on Trade Payables and Trade Receivables

Dependent Variable: CD	Non-financial Firms Sample	Mature Sample	Main Market Sample	Above Avg. WC Sample	High Volatility in Sales Sample
ΔTP	negative	negative	negative	negative	negative
ΔTR	negative	negative	negative	negative	negative

The specific results are reported in Tables 4.13, 4.15, 4.17, 4.19 and 4.21, respectively.
Source: Author's calculations

In the subsample of non-financial firms, mature, main market, above average WC, and high volatility in sales, we found that both changes in trade payables and trade receivables report a negative coefficient, and both of the variables are significant. This suggests that not only does a change in trade payables have an adverse effect on the dividend payout, but a change in trade receivables also sets a burden on the dividend payout. An increase in the change in trade receivables indicates more transactions are made via trade credit, which would allow customers/clients to delay their cash payments. Therefore, the firm will enlarge the payment collection days, which would result in less available cash available for distributing dividends. The results show that both changes in trade payables and in trade receivables are negatively correlated with dividend payouts. This is different from our expectation that the trade payables and trade receivables variable would report two different coefficients and indicates that firms listed in the LSE manage their working capital conservatively. More specifically, the payment collection period would delay the dividend payout, and firms are reluctant to issue dividends at the cost of increasing current liabilities. We also found that trade payables and trade receivables variables are not significant in the young, AIM, below average WC, and low volatility in sales subsamples. Insignificant results in the rest of the subsamples also suggest that maintaining working capital level at an acceptable level is another important goal for managers, and that they have difficulty in altering dividend payouts using working capital (including trade payables and trade receivables). In conclusion, both trade receivables and trade payables have negative impacts upon dividend payouts.

5.2.4 Research Objective Four

Research objective four’s goal was to examine the impact of working capital on stock dividends and explore stock dividend determinants in the UK stock market. The descriptive analysis (see Table 4.3) shows that the number of firms that paid stock dividends is small. The stock dividend (163 observations) is not widely adopted by firms listed on the LSE, particularly compared to the cash dividend. We also observed that the average stock dividend rate is relatively high (67.75%). This indicates that when firms issue stock dividends, they are less likely to issue cash dividends or engage in stock repurchasing, or, only issue a small proportion of cash dividends or stock repurchases at the same time.

The empirical results reveal that changes in working capital have a significant impact on stock dividend. Specifically, the change in working capital coefficients squared and change in working capital are positively and negatively significant at 1% and 5% levels, respectively. These results suggest that the correlation presents a nonlinear (convex) pattern, which is opposite to the cash dividend model (equation (3.17)). Therefore, changes in working capital also have a nonlinear effect on stock dividends; low volatility in working capital would decrease stock dividends, while high volatility in working capital would increase stock dividends. Similarly, we calculated the working capital turning in the stock dividend model to be 18.41. When the change in working capital is less than 18.411, it has a negative relationship with the stock dividend; when the change in working capital is larger than 18.411, it has a positive impact on the stock dividend. Therefore, one can argue that cash and stock dividends are substitutes when all else is held constant.

In our stock dividend model (see Table 4.20), the firm size coefficient is positive and significant to the stock dividend. This shows that larger firms issue more stock dividends than smaller firms. The EPS coefficient is negatively correlated with the stock dividend (Wei and Xiao, 2009). A low earnings per share indicates that a firm is not profitable and may have difficulty in issuing cash dividends, and therefore, may choose to pay stock dividends instead. Higher earnings per share show that a firm's profits are rising, and it would be more likely to issue cash dividends, rather than stock dividends. Additionally, we found that the inflation coefficient exhibits a positive relationship with the stock dividend. Firms are less likely to issue cash dividends when macroeconomic conditions are unstable. In such a scenario, firms may seek stock dividends as alternatives. The return on equity, tax, gearing ratio, and market to book ratio, stock repurchase and dummy (financial shocks) coefficients are not significant in our stock dividend model. This suggests that the stock dividend payout is not affected by these financial ratios.

After splitting the working capital into trade receivables and trade payables, we found that neither the change in trade payables nor the change in trade receivables is significant in our stock dividend model (equation (3.20)). The earnings per share, firm size and inflation rate coefficients display consistent results: negative and positive, respectively. We found that the market to book ratio is positively correlated with the stock dividend. This means the higher the firm's capitalisation value, the more stock dividends it pays.

Combining the cash dividend and stock dividend findings, it is obvious that the determinants of the stock dividend are very different compared to the cash dividend. The cash dividend model presents more consistent results than the stock dividend model. One possible reason is that the system GMM has several benefits over FE regression, such as controlling for endogeneity, and serial correlation issues in equations (3.17) and (3.18). Another possible reason is that the stock dividend sample is smaller than the cash dividend sample.

5.2.5 Research Objective Five

Research objective five's aim was to test the impact of external financial shocks on firm dividend payouts in the UK stock market. External financial shocks refer to the 2008 global financial crisis and the 2012 double-dip recession in the UK. The descriptive analysis indicates that GDP growth drops significantly, and inflation rises dramatically in both 2008 and 2012. The descriptive analysis also indicates that dividend payouts decrease significantly, at around 17.86% and 23% in 2008 and 2012, respectively (see Table 4.1 and Figure 4.1).

Interestingly, we observed that some financial indicators (such as stock repurchase, working capital, trade payables and trade receivables etc.) performed poorly in 2008 and 2012. However, the empirical results show that the external financial shock dummy variable was not significant in the overall sample. Similarly, the external financial shocks coefficient reports insignificant signs in the subsample analyses. We also observed that GDP growth reports a positive and significant coefficient in some of our samples.

The significant GDP growth coefficient demonstrates that the healthier an economy, the higher dividend payouts are (Bozos et al., 2011). However, when economic conditions are unfavourable, dividend payouts are largely unaffected.

5.3 Implications

5.3.1 Academic Implications

First, we redefined the earnings variable as dividend-adjusted earnings and obtained consistent results. The insignificant coefficient of (dividend-adjusted) earnings in the regressions demonstrates that current earnings are not firms' primary concerns when setting dividend policy. We argue that it is necessary for scholars to retest these hypotheses using our definition of earnings, which mitigates issue within the variables and provides unbiased results.

Besides, the dynamic relation of dividends (both cash and stock dividends) reveal that the previous dividend payout has a significant impact on current dividend payouts. However, the dynamic relationship between the cash dividend model and the stock dividend model is different. The lag of the cash dividend is positively correlated with the cash dividend, while the lag of the stock dividend has a negative impact on the stock dividend. The results also suggest that the cash dividend is more popular than the stock dividend for firms listed on the LSE. It also shows that they are reluctant to cut cash dividends (Brav et al., 2005).

Our results shed light on the dividend determinants by providing new evidence. There is a concave relationship between working capital and dividend payout in the overall sample. In other words, a relatively low change in working capital has a positive impact on dividend payouts, while a relatively high change in working capital is negatively correlated with dividend payouts. In short, dividend payouts depend on changes in working capital. Further, this concave relationship is a mixture of linear correlation (in the positive group) and a concave correlation (in the positive and negative group). This suggests that when exploring dividend payouts, a variable may present a nonlinear relationship, not just linear correlations (which is what most of the previous literature has focused on). Firms' often make short-term decisions based on their working capital. Our results also show that the short-term financial indicator (change in working capital) has a significant impact on the dividend payout, which could be short-term (a special issue of dividend), or long-term (dividend policy).

Third, the control variable findings are consistent on most occasions and can be explained reasonably well using the life-cycle theory (Mueller, 1972; Skinner, 2008). The theory suggests that young and small firms with high growth opportunities tend to issue low/no dividends because their cash flows may be low, compared to their capital expenditure. When firms mature and earn greater profits (or have more stable cash flows), it is more likely that the firms will issue a higher dividend (Mueller, 1972; Skinner, 2008). The insignificant coefficients of dividend-adjusted earnings, investment, stock repurchase, and dummy (fs) indicate that a firm's dividend policy is irrelevant to its current earnings, investment policy, repurchase plan and external financial shocks.

The stock dividend regression (see Table 4.20) reveals that a change in working capital also has a significant impact on stock dividend payouts. It shows a convex relation, which is opposite to the cash dividend model findings. The results suggest that cash and stock dividends are substitutes for each other under our working capital hypothesis.

The stock dividend option sends a good signal to shareholders (McNihols and Dravid, 1990; Bessembinder and Zhang, 2015). Other studies show that firms unable to issue cash dividends will pay stock dividends instead as substitutes (such as Lakonishok and Lev, 1987; David and Ginglinger, 2016). This practice is normally viewed negatively. However, whether a stock dividend announcement is a positive or a negative sign is difficult to investigate in the current study, since stock dividend observations are small in our sample. What we observed is that the stock dividend is not as popular as the cash dividend (the number of firms that issued a stock dividend and the number of stock dividends that have been issued) for firms listed on the LSE. As Lasfer (1997b) suggests, a stock dividend is not used to save corporation tax and firms are less likely to issue any stock dividends when they have insufficient cash or financial difficulties. The main reasons for issuing stock dividends is shareholder pressure. Therefore, in our case, it is likely that shareholders have not demanded a stock dividend. We also found that stock dividend payout determinants are different from cash dividend determinants (see Tables 4.8 and 4.20).

Regarding the methodology, the GMM instrument variables (cash dividend, stock repurchase, investment, market to book ratio and changes in working capital) with lagged levels (t-2) to (t-3) are valid, and the two-step system GMM provided consistent results. Previous literature has revealed that it is important to address potential endogeneity problems within the data and obtain robust results (see Wooldridge, 2010; Wintoki et al., 2012 and Roberts and Whited, 2013). The results indicate that the GMM estimator handles this issue well in comparison to other IVs methods (2SLS, and QML).[59]

5.3.2 Managerial and Policy Implications

According to our empirical results, the unadjusted earnings have a positive and significant impact on dividend payouts. However, the consistent results (insignificant dividend-adjusted earnings coefficient) suggest that current earnings are irrelevant (or at least should not be viewed as the most important factor) in relation to dividend payouts.

We also observed a concave relationship between changes in working capital and dividend payouts in our overall sample. This shows that working capital managers should consider the effect of their decisions on dividend payouts. It also increases working capital managers' workloads, which involves trade-offs between dividend payouts and other short-term decisions. Similarly, firm policymakers also need to be aware of the potential of working capital as a source for dividend payout. In other words, short-term decisions (for example, working capital) may affect long-term decisions (for example, dividend payouts). However, we also found that this concave relationship does not apply to all of the firms listed on the LSE. The subsample analysis shows that this concave relationship is robust in 527 firms with a change in working capital higher and lower than the turning point. For the rest of the 1,048 firms, a positive and linear correlation between the change in working capital and dividend payout was observed (see also Figure 5.1). Since managers are reluctant to cut dividends and prefer to maintain stable dividend payouts (Brav et al., 2005; Al-Malkawi et al., 2014; Javakhadze et al., 2014), our results provide managers with another way of looking at dividend policy: using working capital to adjust dividend payouts. However, this recommendation can only be adopted when a firm has relatively higher changes in its working capital. In other words, for those firms with a lower change in their working capital (lower than the turning point), it will be a challenge to implement.

Using working capital for dividend payouts is not limited to these 527 firms, since a firm's working capital can change from period to period. If a firm's change in working capital drops below the turning point for some periods, then this firm will shift from the positive and negative group (527 firms) to the positive group (1,048 firms). Likewise, if a firm increases its change in working capital substantially

[59] The 2SLS and Quasi-Maximum Likelihood (QML) were used to estimate cash dividend models, but the results are not significant. These results are available upon request.

(from a value below the turning point to a value over the turning point) for some periods, then the firm can adopt this recommendation. In addition, the concave relationship between working capital and dividend payouts holds for both financial firms and non-financial firms. Using working capital for dividend payouts is not just for non-financial firms.

The turning point of change in working capital plays a crucial role in dividend payouts. As reported, the turning points of change in working capital are 9.837, 2.21, 3.848, 5.841 and 7.10 per cent for the non-financial firms, Mature, MM, Above Average WC and High volatility in Sales subsamples, respectively. The turning point of the change in working capital is different based on different subsamples' regression. Nevertheless, the turning point (change in working capital) sets a rough benchmark (when all else is held constant), for firms either in the positive group or the positive and negative group. It also helps firms to understand dividend payouts via working capital. Managers should use the turning point with great care. This is because each firm has a unique turning point of change in working capital. It is not a fixed value and can change over the accounting period. Additionally, working capital management plays a significant role in firm performance (see Chapter 2). It is necessary for managers to evaluate the costs and benefits of adopting this recommendation in regards to other financial purposes.

In the overall sample analysis, the negative relationship between the change in trade payables and the dividend payout suggests that firms' priority is to pay debts (which are due within 12 months), rather than issue cash dividends. The negative correlation also reveals that managers understand the risks of issuing a cash dividend at the cost of delaying the payment of short-term debts. This relationship is further confirmed in the subsamples of non-financial firms, mature, MM, Above Average WC and High volatility in Sales. The subsample results demonstrate that the change in trade receivables has a negative impact on the cash dividend payout. This means that the more business transactions are made on credit, the fewer dividend payouts will be. A decrease in the trade receivables suggests that a firm receives payments from the previous deal(s) on credit, and the firm's cash balance will increase. In this case, the firm is more likely to issue cash dividends. Therefore, managers could try to adopt a more efficient way to collect trade receivables or redeem payment via outsourcing trade receivables to a third party if the shareholders require dividends.

In terms of the insignificant result between working capital (including trade payables/receivables) and dividends in the subsamples, we noticed that these firms' net working capital is at a relatively low level (some of these firms may have a negative change in their working capital). This suggests that the managers do not prioritise dividend payouts. It is most likely that some of these managers are struggling to improve firm profitability or their working capital management. It may be difficult for them to change dividend payouts via working capital at such an early stage, but our results also set a goal (the turning point of change in working capital) for managers/policymakers if they so desire to do so in the future. Finally, the insignificant coefficient of the dummy variable on financial shocks demonstrates that dividend payouts are not greatly affected by changes to the UK economy.

5.4 Contributions

The current study contributes to the dividend literature and managerial practice in several ways. First, we have foregrounded problems with the traditional measurement of earnings, arguing that it may cause collinearity problems. After defining the dividend-adjusted earnings, we have remedied this issue and increased the model's efficiency. We found that dividend payout is not affected by current earnings. Earnings are not a key determinant of dividend payouts.

Second, to the best of our knowledge, this is the first study that links changes in working capital and dividend payouts. The proposed dividend payout, via working capital, bridges the gap in the dividend payout literature. Previous studies have either independently linked the working capital to firm performance, such as profitability, or examined the relationship between earnings and dividend payout (see for example, Lintner, 1956; Denis and Osobov, 2008; Baños-Caballero et al., 2014; Aktas et al., 2015). The nonlinear relationship between working capital (trade receivables and trade payables) and dividend payout sheds new light on working capital management, which is often associated with short-term financial decisions. The current study reveals that short-term financial decisions can also affect long-term financial decisions, such as dividend payout.

Third, we have observed that mature firms, firms listed on the AIM, firms with sufficient working capital, and firms with high volatility in sales tend to adjust their dividend payouts via working capital. Our empirical results provide managers/policymakers with an alternative solution to dividend payouts (with different implications). Before adopting this solution, managers should pay close attention to the turning point (change in working capital). More specifically, it is feasible for managers in the 566 firms (positive and negative group) to alter their dividend payouts. If managers in the positive group (with a low change in working capital) seek to change their dividend payouts using the working capital, it is critical for them to be aware that the dividend payout will not decrease until the turning point of change in working capital is reached. For insignificant result groups, our core finding also provide managers/policymakers with a goal if they are interested in using working capital to fund dividend payouts in the future. Overall, our results provide new insight into the value of working capital, and suggest dividend payout via working capital is important for understanding corporate payout policy.

Moreover, the current study has provided evidence on the stock dividend payout of the UK stock market, which is often omitted/less observed in previous studies. The results show that stock and cash dividends are substitutes, when all else is held constant. The literature provides evidence on firms' dividend payouts under the 2008 global financial crisis. However, the 2012 economic recession, the longest double-dip recession of the last 50 years, has largely been ignored in the literature regarding dividend payouts in the UK stock market. Our study has included both recessions and thus provides more comprehensive findings on dividend payouts under external financial shocks.

Table 5.3 Dividend Payout Studies in Literature (Partial)

Year	Author/s (Last name)	Research Method	Country/Market	Period Analysed
1956	Lintner	OLS	US	1947–1953
1978	Eisemann and Moses	Questionnaire, Survey	US	1975
1980	Aharony and Swary	OLS	US	1963–1976
1994	Sant and Cowan	OLS	US	1962–1987
1994	Schooley and Barney	OLS	US	1975–1985
1996	Lasfer	GLS	UK	1973–1983
1996	Noronha et al.	OLS	US	1986–1988
1998	Adedeji	OLS	UK	1993–1996
2001	Fama and French	Logit	US	1926–1999
2002	Short et al.	GLS	UK	1988–1992
2005	Brav et al.	Survey	US	1950–2002
2006	Bhaduri, Durai	Granger Causality	India	1992–2004
2006	Goddard et al.	VAR	UK	1970–2003
2007	Bond et al.	OLS	UK	1994–2001
2008	Skinner	Logit	US	1970–2005
2008	von Eije and Megginson	OLS	European Union	1989–2005
2009	Brockman and Unlu	Random Effects	52 Countries	1990–2006
2009	Wei and Xiao	Random Effects	China	1995–2006
2010	Engsted and Pedersen	OLS and VAR	US and Europe	1926–2008
2014	Al-Malkawi et al.	Tobit	Oman	2001–2010
2014	Brunzell et al.	Survey	Nordic Countries	2007–2008
2014	McMillan	Fixed Effects	Cross Countries	1973–2010
2014	Nirmala et al.	Panel VECM	India	1999–2008
2015	Bildik et al.	OLS	US and 32 Countries	1985–2011
2015	Moon et al.	OLS	US	2000–2012
2016	Attig et al.	Tobit	East Asian	2006–2010

Source: Author's compilation

The current study also contributes to literature regarding the methodology of dividend payouts. Table 5.3 illustrates that the literature on dividend payouts normally adopts traditional OLS/GLS or "static models," which may lead to biased results. Most finance variables present endogeneity issues (Wintoki et al., 2012) and thus, violate the effectiveness of the findings and implications in the previous literature. Our study has overcome this issue by adopting the two-step system GMM estimator and provides unbiased and robust results, which do not misguide/mislead scholars and managers/policymakers.

5.5 Research Limitations

There are a few limitations in the current study. Firstly, the secondary data that we collected from the *Bloomberg* Database has missing values (it is unbalanced panel), especially in the early period (the 1990s). Those missing values reduce the representativeness of our sample firms, to some extent, and may distort inferences about the population firms. However, according to the LSE, firms were not obliged to report financial data during this period. Thus, the missing values are unavoidable under these circumstances.

Secondly, the stock dividends (ratios), which are not directly available in the *Bloomberg* Database, are based on a simple calculation, and cannot represent the precise firm stock dividend payouts. However, the number of firms that issue stock dividends (around 8% of all listed firms) is much smaller compared to the number of firms that issue cash dividends. Therefore, the overall data sample for the stock dividend model is relatively small.

As discussed in Chapter 3, we have emphasised the benefits of the GMM estimator over the FE model and our reasons for adopting the GMM model. However, in the stock dividend sample, we used the FE estimator instead. This is because of the small number of observations in the stock dividend, which means that the GMM estimator was not suitable. Thus, if the endogeneity issue presents in the FE models, our stock dividend models may be biased and we do not offer evidence of a causal relationship between stock dividend and working capital. Therefore, readers should interpret our results carefully.

The current study only focused on the financial aspects of firms' dividend payouts in the UK stock market. The proposed dividend payout via working capital model neglects managerial perspectives. While this was not part of our study's objectives we believe that the non-financial perspectives of dividend payouts are equally important.

5.6 Recommendations for Future Research

Future studies may also add the dividend-adjusted earnings as one explanatory variable along with the retained earnings regarding dividend payout. Whilst the information contained in the dividend is related to quarterly earnings and sales, future research could use quarterly earnings or sales data (both in forecasted and realised) to test whether dividend payouts are a function of quarterly earnings or sales. By doing so, more coherent evidence on the relationship between earnings and the dividend payouts could be observed.

Future studies might also examine whether the dividend payout via working capital holds in other stock markets, for example, in emerging/frontier stock markets, or extend it through a cross-sectional study and compare the results for different stock markets. Although the financial firms and non-financial firms do not show significant differences in our empirical analysis, it is necessary and advisable to control for industry-specifics when exploring the relationship between working capital and dividend payouts in future studies.

The current study shows that trade payables are negatively correlated with dividend payouts. If trade payables cannot be increased, it is theoretically feasible that short-term debt may ease constraint on the payment of dividends, according to dividend signalling theory. Future studies may investigate whether other shorter-term debts have an impact on dividend payouts.

Primary research (using survey questionnaire or interview) on the managerial perspective of the feasibility of changing dividends though working capital would be an interesting avenue for future research. In particular, interviewing working capital managers about their thoughts on the correlation between working capital and dividend payout, and whether managers are willing to use the working capital for dividend payout would provide important practical information. For example, if working capital managers are reluctant to use this approach when shareholders demand dividend payouts, this may create a conflict of interest between the parties. Similarly, gathering policymakers' opinions on investors' preferences for investment decisions, business expansion (working capital) and payout policy will provide more insight into this matter. Policymakers' responses could also provide useful information regarding the trade-offs among dividend-related financial decisions and current payout policy rationales.

Apart from the managerial perspective, future studies could also examine the economic consequences of firms that use working capital for dividend payouts, and compare these with others who do not. Scholars could also explore whether working capital managers and policymakers exhibit any significant differences regarding dividend payouts. Using working capital for dividend payouts may involve the debtholders (short-term debts) and shareholders (dividends), thus future studies could examine whether debtholders/working capital managers and shareholders have any conflict of interests regarding the use of working capital for dividend payouts.

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Appendices

Appendix 1(a): Robustness Check in the Overall Sample: Cash Dividend (Eq. 3.17)

Dependent Variable: CD	Coefficients	*t*-statistics	*p*-value
CD(t-1)	0.705	16.82	0.000***
	(0.042)		
WC^2	- 3.517	-1.99	0.022**
	(1.770)		
WC	0.144	2.10	0.001***
	(0.068)		
Div-adj Earnings	-1.477	-0.92	0.359
	(1.608)		
Tax	15.128	4.30	0.000***
	(3.516)		
Inv	-0.670	-0.15	0.884
	(4.590)		
Gearing (%)	- 0.042	-4.52	0.000***
	(0.009)		
MtB (%)	1.084	6.52	0.000***
	(0.166)		
Size	1.867	4.33	0.000***
	(0.432)		
Rep(t-1)	- 11.836	-0.25	0.806
	(48.193)		
Dum(fs)	-0.261	-0.49	0.623
	(0.529)		
GDPg (%)	0.120	1.71	0.088*
	(0.070)		
Inf (%)	- 0.088	-0.72	0.470
	(0.122)		
Constant	-3.410	-2.30	0.022**
	(1.481)		
m_2			0.110
Hansen J-test (*p*-value)			0.162
Diff-Hansen test (*p*-value)			0.229
Number of observations			14,274

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity and within the firm's serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets.
*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

Appendix 1(b): Robustness Check in the Overall Sample: Cash Dividend (Eq. 3.18)

Dependent Variable: CD	Coefficients	*t*-statistics	*p*-value
CD(t-1)	0.513	14.40	0.000***
	(0.036)		
TP	-3.815	-2.22	0.021**
	(1.719)		
TR	-6.284	-1.88	0.030**
	(3.343)		
Div-adj Earnings	-0.425	0.33	0.743
	(1.296)		
Tax	19.494	5.90	0.000***
	(3.305)		
Inv	1.564	0.24	0.809
	(6.485)		
Gearing (%)	-0.053	-4.56	0.000***
	(0.012)		
MtB	1.296	7.12	0.000***
	(0.182)		
Size	3.010	7.21	0.000***
	(0.418)		
Rep(t-1)	-21.564	-1.28	0.202
	(16.907)		
Dum(fs)	0.383	0.89	0.371
	(0.428)		
GDPg (%)	0.206	3.25	0.001***
	(0.063)		
Inf (%)	-0.161	-1.33	0.184
	(0.121)		
Constant	-1.779	-0.87	0.387
	(2.056)		
m_2			0.276
Hansen J-test (*p*-value)			0.172
Diff-Hansen (*p*-value)			0.165
Number of observations			14,261

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. *, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

Appendix 2(a): Robustness Check in the Mature Sample: Cash Dividend (Eq. 3.17)

Dependent Variable: CD	Coefficients	*t*-statistics	*p*-value
CD(t-1)	0.540	10.98	0.000***
	(0.049)		
WC^2	- 3.837	-2.92	0.035**
	(1.314)		
WC	1.517	1.78	0.043***
	(0.852)		
Div-adj Earnings	-2.652	-1.04	0.298
	(2.547)		
Tax	20.155	5.34	0.000***
	(3.777)		
Inv	-2.103	-0.29	0.773
	(7.292)		
Gearing (%)	- 0.045	-5.03	0.000***
	(0.009)		
MtB (%)	1.237	5.38	0.000***
	(0.230)		
Size	2.691	5.70	0.000***
	(0.472)		
Rep(t-1)	1.334	0.08	0.940
	(17.753)		
Dum(fs)	-0.518	-0.66	0.506
	(0.779)		
GDPg (%)	0.208	2.12	0.035**
	(0.098)		
Inf (%)	- 0.002	-0.01	0.988
	(0.166)		
Constant	-3.993	-1.96	0.050**
	(2.035)		
m_2			0.443
Hansen J-test (*p*-value)			0.209
Diff-Hansen test (*p*-value)			0.827
Number of observations			8,383

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity and within the firm's serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets.

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations

Appendix 2(b): Robustness Check in the Mature Sample: Cash Dividend (Eq. 3.18)

Dependent Variable: CD	**Coefficients**	***t*-statistics**	***p*-value**
CD(t-1)	0.540	11.05	0.000***
	(0.049)		
TP	-10.172	-2.11	0.036**
	(4.830)		
TR	-3.529	-1.82	0.012**
	(1.939)		
Div-adj Earnings	-1.242	-0.47	0.641
	(2.662)		
Tax	21.108	5.36	0.000***
	(3.939)		
Inv	0.222	0.03	0.973
	(6.585)		
Gearing (%)	-0.044	-5.37	0.000***
	(0.008)		
MtB	1.204	6.18	0.000***
	(0.195)		
Size	2.315	6.26	0.000***
	(0.370)		
Rep(t-1)	3.683	0.21	0.832
	(17.382)		
Dum(fs)	-0.180	-0.29	0.771
	(0.616)		
GDPg (%)	0.298	2.92	0.004***
	(0.102)		
Inf (%)	-0.023	0.14	0.888
	(0.162)		
Constant	1.387	0.71	0.481
	(1.966)		
m_2			0.431
Hansen J-test (*p*-value)			0.393
Diff-Hansen (*p*-value)			0.299
Number of observations			8,371

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. *, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

Appendix 3(a): Robustness Check in the MM Sample: Cash Dividend (Eq. 3.17)

Dependent Variable: CD	**Coefficients**	***t*-statistics**	***p*-value**
CD(t-1)	0.518	12.22	0.000***
	(0.042)		
WC^2	-5.560	-2.47	0.031**
	(2.251)		
WC	0.960	1.38	0.017**
	(0.696)		
Div-adj Earnings	-10.558	-2.24	0.126
	(4.714)		
Tax	34.107	5.91	0.000***
	(5.771)		
Inv	-2.522	-0.34	0.734
	(7.413)		
Gearing (%)	-0.050	-4.65	0.000***
	(0.011)		
MtB (%)	1.668	6.81	0.000***
	(0.245)		
Size	1.649	2.67	0.008***
	(0.617)		
Rep(t-1)	10.667	0.52	0.606
	(20.691)		
Dum(fs)	-0.663	-0.64	0.522
	(1.034)		
GDPg (%)	0.194	1.68	0.093*
	(0.115)		
Inf (%)	0.160	0.78	0.439
	(0.206)		
Constant	0.187	0.05	0.957
	(3.494)		
m_2			0.207
Hansen J-test (*p*-value)			0.245
Diff-Hansen test (*p*-value)			0.569
Number of observations			7,534

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity and within the firm's serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets.

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations

Appendix 3(b): Robustness Check in the MM Sample: Cash Dividend (Eq. 3.18)

Dependent Variable: CD	**Coefficients**	***t*-statistics**	***p*-value**
CD(t-1)	0.520	12.57	0.000***
	(0.041)		
TP	3.193	0.49	0.625
	(6.527)		
TR	-5.259	-3.91	0.037**
	(1.345)		
Div-adj Earnings	-9.711	-1.03	0.442
	(9.428)		
Tax	34.306	5.71	0.000***
	(6.009)		
Inv	-4.593	-0.67	0.502
	(6.840)		
Gearing (%)	-0.050	-4.93	0.000***
	(0.010)		
MtB	1.655	7.12	0.000***
	(0.233)		
Size	1.564	3.25	0.001***
	(0.482)		
Rep(t-1)	9.968	0.46	0.649
	(21.862)		
Dum(fs)	-0.167	-0.21	0.836
	(0.806)		
GDPg (%)	0.254	2.16	0.031**
	(0.117)		
Inf (%)	0.100	0.49	0.622
	(0.203)		
Constant	0.627	0.19	0.847
	(3.258)		
m_2			0.201
Hansen J-test (*p*-value)			0.349
Diff-Hansen (*p*-value)			0.728
Number of observations			7,522

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. *, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

Appendix 4(a): Robustness Check in the Above Avg. WC Sample: Cash Dividend (Eq. 3.17)

Dependent Variable: CD	**Coefficients**	***t*-statistics**	***p*-value**
CD(t-1)	0.429	8.40	0.000***
	(0.051)		
WC^2	-8.874	-2.46	0.043**
	(3.607)		
WC	15.136	2.76	0.044**
	(5.484)		
Div-adj Earnings	0.472	0.17	0.867
	(2.810)		
Tax	34.953	6.33	0.000***
	(5.521)		
Inv	1.859	0.21	0.832
	(8.777)		
Gearing (%)	-0.034	-2.67	0.008***
	(0.013)		
MtB (%)	1.466	5.58	0.000***
	(0.263)		
Size	2.719	4.23	0.000***
	(0.643)		
Rep(t-1)	17.005	0.64	0.521
	(26.462)		
Dum(fs)	-0.333	-0.44	0.663
	(0.764)		
GDPg (%)	0.232	1.99	0.047**
	(0.116)		
Inf (%)	-0.162	-0.07	0.948
	(0.247)		
Constant	-8.610	-1.58	0.113
	(5.431)		
m_2			0.305
Hansen J-test (*p*-value)			0.122
Diff-Hansen test (*p*-value)			0.196
Number of observations			5,997

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity and within the firm's serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets.

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations

Appendix 4(b): Robustness Check in the Above Avg. WC Sample: Cash Dividend (Eq. 3.18)

Dependent Variable: CD	**Coefficients**	***t*-statistics**	***p*-value**
CD(t-1)	0.420	8.05	0.000***
	(0.052)		
TP	-1.505	-2.28	0.018**
	(0.280)		
TR	-9.891	-1.97	0.049**
	(5.027)		
Div-adj Earnings	0.183	0.07	0.943
	(2.573)		
Tax	35.058	6.05	0.000***
	(5.793)		
Inv	-0.379	-0.05	0.962
	(0.011)		
Gearing (%)	-0.310	-2.79	0.005***
	(0.011		
MtB	1.334	5.31	0.000***
	(0.251)		
Size	2.839	4.69	0.000***
	(0.605)		
Rep(t-1)	4.804	0.19	0.851
	(25.515)		
Dum(fs)	-0.192	-0.24	0.808
	(0.792)		
GDPg (%)	0.327	2.88	0.004***
	(0.113)		
Inf (%)	-0.138	-0.59	0.554
	(0.233)		
Constant	-0.531	-0.20	0.845
	(2.713)		
m_2			0.347
Hansen J-test (*p*-value)			0.267
Diff-Hansen (*p*-value)			0.227
Number of observations			5,995

Dynamic cash dividend (CD) regression was estimated by two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. *, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

Appendix 5(a): Robustness Check in the High ∆Sales Sample: Cash Dividend (Eq. 3.17)

Dependent Variable: CD	Coefficients	*t*-statistics	*p*-value
CD(t-1)	0.471	5.91	0.000***
	(0.080)		
WC^2	-2.037	-2.56	0.018**
	(0.796)		
WC	1.860	2.53	0.039**
	(0.735)		
Div-adj Earnings	0.932	0.32	0.753
	(2.959)		
Tax	28.814	3.69	0.000***
	(7.808)		
Inv	15.886	1.11	0.266
	(14.265)		
Gearing (%)	-0.027	-2.69	0.007***
	(0.010)		
MtB (%)	0.819	2.16	0.031**
	(0.380)		
Size	1.832	2.58	0.010***
	(0.710)		
Rep(t-1)	63.945	1.11	0.267
	(57.620)		
Dum(fs)	-1.136	-0.63	0.528
	(1.800)		
GDPg (%)	0.019	0.09	0.925
	(0.203)		
Inf (%)	-0.816	-2.28	0.023**
	(0.358)		
Constant	2.177	0.74	0.460
	(2.943)		
m_2			0.432
Hansen J-test (*p*-value)			0.566
Diff-Hansen test (*p*-value)			0.453
Number of observations			2,803

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity and within the firm's serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets.

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations

Appendix 5(b): Robustness Check in the High ΔSales Sample: Cash Dividend (Eq. 3.18)

Dependent Variable: CD	Coefficients	*t*-statistics	*p*-value
CD(t-1)	0.493	6.25	0.000***
	(0.078)		
TP	-2.393	-2.35	0.024**
	(1.018)		
TR	-4.443	-2.69	0.049**
	(1.651)		
Div-adj Earnings	0.392	0.15	0.878
	(2.560)		
Tax	27.304	3.55	0.000***
	(7.684)		
Inv	9.918	0.84	0.400
	(11.780)		
Gearing (%)	-0.024	-2.22	0.027**
	(0.011)		
MtB	0.719	2.18	0.030**
	(0.330)		
Size	1.876	3.06	0.002***
	(0.613)		
Rep(t-1)	59.961	1.02	0.307
	(58.723)		
Dum(fs)	-0.993	-0.56	0.576
	(1.776)		
GDPg (%)	0.128	0.62	0.533
	(0.206)		
Inf (%)	-0.795	-2.20	0.028**
	(0.362)		
Constant	4.268	1.38	0.167
	(3.090)		
m_2			0.418
Hansen J-test (*p*-value)			0.206
Diff-Hansen (*p*-value)			0.177
Number of observations			2,794

Dynamic cash dividend (CD) regression is estimated using two-step system GMM. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity and within firm serial correlation. m_2 is a serial correlation test of second-order using residuals of first differences. Hansen J-test is a test of over-identifying restrictions. Diff-Hansen test reports the exogeneity of instrument subsets. *, ** and *** represent significance at 10%, 5% and 1% levels, respectively.
Source: Author's calculations

Appendix 6: Robustness Check in the Overall Sample: Stock Dividend (Eq. 3.19)

Dependent Variable: SD	**Coefficients**	***t*-statistics**	***p*-value**
SD(t-1)	-0.281	-2.01	0.047**
	(0.139)		
ΔWC²	30.465	2.85	0.018**
	(10.690)		
ΔWC	-13.556	-2.83	0.038**
	(4.795)		
ROE	-0.070	-0.41	0.681
	(0.170)		
EPS	-7.430	-1.58	0.119
	(4.717)		
Tax	-22.728	-0.97	0.337
	(23.551)		
Size	15.686	1.98	0.051*
	(7.907)		
Gearing	-0.041	-1.45	0.151
	(0.029)		
MtB	0.339	1.78	0.078*
	(0.190)		
Rep(t-1)	29.950	0.60	0.553
	(50.296)		
Dum(fs)	-0.232	-0.04	0.965
	(5.216)		
GDPg	3.436	0.91	0.363
	(3.759)		
Inf	1.407	1.72	0.089*
	(0.818)		
Constant	-97.555	-1.85	0.068*
	(52.711)		
F-Statistics (*p*-value)			36.08***
R-square			43.36%
Number of observations			163
Number of firms			82

Dynamic stock dividend (SD) regression is estimated using Fixed-Effects Regression. Fixed firm and time effect are included. All variables are winsorised (except for Size) at the 1% level to mitigate the impact of outliers. Standard errors are robust to heteroscedasticity.

*, ** and *** represent significance at 10%, 5% and 1% levels, respectively.

Source: Author's calculations